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**Combining Scenario Workshops and
Participatory System Dynamics
Modelling to Study Food Security. A
case study with farmers in Zambia**

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Resumo

A segurança alimentar é uma questão mundialmente conhecida tanto a nível económico, político e, também, científico, que afeta principalmente os países em desenvolvimento. Alcançar a segurança alimentar é um processo muito complexo que envolve não só a habilidade e capacidade para a agricultura, mas também uma adaptação constante aos fenómenos naturais, como, por exemplo, os padrões de precipitação. O conhecimento limitado e o restrito acesso à informação e tecnologias, são fatores que reduzem a capacidade das comunidades agrícolas locais para alcançar a segurança alimentar. Além disso, existem poucos métodos e ferramentas adequados para envolver os *stakeholders*, tais como os agricultores, no desenvolvimento e avaliação de políticas alimentares e os seus respetivos efeitos a longo prazo em todo o sistema.

O objetivo principal desta dissertação é investigar como o uso de métodos mistos - cenários e modelação participada em dinâmica de sistemas - são capazes de melhorar a compreensão através de uma visão integrada dos sistemas alimentares, servindo como uma alavanca no processo da tomada de decisão nas questões relativas à segurança alimentar. Ainda, esta dissertação tem como objetivo responder as seguintes duas questões: i) Como cenários e a dinâmica de sistemas podem ser usados em conjunto para estudar possíveis futuros de segurança alimentar envolvendo agricultores locais em países em desenvolvimento? ii) Num contexto de agricultura de subsistência, em países da África-Subsaarianos, quais são as possíveis políticas e respetivos caminhos para evitar situações indesejáveis e estimular as desejáveis? Para este propósito específico, um grupo de agricultores de subsistência na Zâmbia foi analisado como caso de estudo.

Primeiramente, um *workshop* foi realizado, onde o cenário de pouca pluviosidade e nenhuma ajuda do governo foi desenvolvido, sendo este considerado um cenário indesejado. Com o objetivo de alcançar a segurança alimentar, os participantes tiveram que encontrar propostas e caminhos para evitar ou superar esse cenário. Posteriormente, a partir dos dados do *workshop* de cenário, os diagramas causais foram construídos usando um processo de codificação sistemática. Dado isto, os próximos passos foram analisar as propostas através de uma análise de impacto cruzado, e desenvolver um esboço dos caminhos para estudar a complementaridade e a compatibilidade das propostas. As 11 propostas desenvolvidas neste estudo foram negócios relativos ao carvão vegetal; pecuária; amendoim; jardinagem; empréstimo; trabalhos esporádicos; técnicas para melhorar o solo; arrendamento de casas; parcerias; legislação para a deflorestação e florestação; e bacias de retenção/furos de água. Finalmente, foi possível conceber um Plano de Ação inovador que mostra os caminhos e o ritmo em que cada proposta pode alcançar a segurança alimentar.

Concluiu-se que o *workshop* de cenários e dinâmica de sistemas podem ser utilizados em conjunto, uma vez que esses métodos se complementam, estimulando o sistema de pensamento e o conhecimento. Os *workshops* de cenários são um método disruptivo e exploratório, pois permitem desencadear imagens criativas e também plausíveis dos participantes. A dinâmica de sistemas apoia os processos de tomada de decisão, analisando as propostas e os seus percursos, levando à elaboração de planos de ação. Neste caso de estudo, das 11 propostas identificadas, descobriu-se que os trabalhos esporádicos possibilitam um caminho mais rápido para alcançar a segurança alimentar, enquanto o arrendamento de casas seria o mais lento. Além disso, verificou-se que algumas das propostas poderiam ser reforçadas se implementadas em

conjunto, enquanto outras, como o carvão vegetal e a legislação para a deflorestação e florestação, não mostraram esse potencial. Uma pesquisa de acompanhamento com os participantes do *workshop* mostrou que os mesmos estavam seguindo o plano de ação, o que confirmou a preferência pelas propostas de curto prazo.

Palavras-chave: segurança alimentar, workshop de cenário, plano de ação, diagrama causal, Zâmbia.

Abstract

Food security, which affects mainly developing countries, is a worldwide problem that has called the attention of the economic, political and scientific community. Achieving food security is a very complex process that involves not only the ability of farming but also a constant adaptation to natural phenomena, as for example, rainfall patterns. Limited knowledge and access to information and technologies, restrict the capacity of local farming communities to achieve food security. Furthermore, there is a lack of suitable methods and tools for involving stakeholders, such as farmers, in the development and assessment of food policies and their long-term system-wide effects.

The main goal of this research is to investigate how the use of mixed-methods – scenarios and participatory System Dynamics (SD) modelling – are capable of improving understanding and an integrative view of food systems, serving as a lever for supporting food security decision-making processes. Additionally, this research aims to answer the following two questions: i) How can scenarios and participatory SD be used together to study plausible futures of food security involving smallholder farmers in developing countries?; ii) What are the possible policy pathways to avoid undesirable situations and to stimulate desirable ones, in a context of subsistence farming in Sub-Saharan African countries?. For this specific purpose, a group of smallholder farmers in Zambia was analyzed as a case study.

First, a workshop was implemented in which a scenario of poor rainfall and no government help was developed. In order to achieve food security, participants had to find policy proposals and pathways to avoid or to overcome this undesired scenario. Subsequently, from the scenario workshop data, causal loop diagrams (CLD) were built using a systematic coding process. The next steps were to analyse policy proposals through a cross-impact analysis and develop an outline of pathways to study the complementarity and compatibility of such proposals. The 11 policy proposals were Charcoal Business; Livestock Business; Groundnuts Business; Gardening; Loan; Piecework; Land (productive land); Rental Business; Partnership; Legislation for Deforestation/Afforestation; and, Retention Basins/Drilling Boreholes. Finally, it was possible to design an innovative Action Plan that shows the pathways and the pace at which each proposal may achieve food security. It was concluded that scenario workshop and participatory SD may tightly coupled since these methods complement each other, stimulating system thinking and co-creation of knowledge. Scenario workshops are a disruptive and exploratory method, as it allows to elicit creative and plausible images from participants. Participatory SD supports decision-making processes by analysing policy proposals and its pathways, leading to the elaboration of joint action plans. In the Zambian case, from the 11 plausible policy proposals, it was found that Piecework enables a swifter path to achieve food security, while Rental Business would be the slowest. Additionally, it was found that some of the policy proposals could be reinforced if implemented together, while others, such as Charcoal Business and Legislation for Deforestation/Afforestation, did not show such potential. A follow-up survey with workshop participants showed that they were following the Action Plan, confirming the preference for the short-term policy proposal pathways.

Keywords: food security, scenario workshop, action plan, causal loop diagram, Zambia.

Table of Contents

1.	Introduction.....	1
1.1.	About the topic	1
1.2.	Objectives and research questions.....	2
1.3.	Organization of the thesis	3
2.	Literature Review	5
2.1.	Food Security in developing countries.....	5
2.2.	Visioning, scenarios and backcasting.....	9
2.3.	Participatory System Dynamics modelling.....	19
2.4.	Mixed methods approach.....	23
3.	Methodology	27
3.1.	Data collection and analysis methods	27
3.1.1.	System Thinking workshop 2015 (Hager et al., 2015)	28
3.1.2.	Preparation of the Scenario Workshop	30
3.1.3.	Workshops and data collection	31
3.1.4.	Follow-up	31
3.2.	Data processing and analysis	32
3.2.1.	Coding Method	32
3.2.2.	CLD analysis – Leverage Points by Meadows.....	35
3.2.3.	Cross-impact analysis	35
3.2.4.	Outline policy proposals pathways.....	36
3.2.5.	Action Plan Outline	36
4.	Results and Discussion.....	37
4.1.	Case study	37
4.2.	Preliminary Models – System Thinking workshop in 2015	40
4.3.	Scenario workshops.....	41
4.3.1.	Participants.....	41
4.3.2.	Scenario Workshop activities	46
4.4.	Data processing and analysis	48
4.4.1.	Coding Charts – coding method.....	48
4.4.2.	Words-and-arrows diagrams – coding method	48
4.4.3.	Causal Loop Diagrams/Maps	49
4.4.3.1.	Lessons Learned from the System Thinking workshop	49
i.	<i>What to do with cash?</i>	49
ii.	<i>How to increase/decrease cash?</i>	50
iii.	<i>How to get food?</i>	51
iv.	<i>How to improve land fertility/farming?</i>	52
v.	<i>How to increase livestock?</i>	53
vi.	Integrated CLD depicting Lessons Learned from the System Thinking workshop....	54
4.4.3.2.	Policy proposals under a worst case scenario	56
A.	<i>Charcoal Business</i>	56
B.	<i>Livestock Business</i>	57
C.	<i>Groundnuts Business</i>	60
D.	<i>Gardening</i>	60
E.	<i>Loan</i>	60
F.	<i>Piecework</i>	61
G.	<i>Land (productive land)</i>	66
H.	<i>Rental Business</i>	66
I.	<i>Partnership</i>	69
J.	<i>Legislation for Deforestation/Afforestation</i>	69
K.	<i>Retention Basins/Drilling Boreholes</i>	72
4.4.3.3.	Integrated CLD combining all policy proposalsl	72
4.4.4.	Prospecting interrelationships between the policy proposals	75
4.4.5.	Outlining policy proposals pathways	77
4.4.6.	Action Plan Outline	81
4.5.	Follow-up Actions and Implementation Evaluation.....	85
5.	Conclusions	89

5.1.	Key Lessons Learned	89
5.2.	Future research/developments	91
6.	References	93
	Appendix 1. Scenario workshop 2016 script	97
	Appendix 2. Workshop transcription A	103
	Appendix 3. Workshop transcription B	159
	Appendix 4. Follow-up transcripts groups A and B	211
	Appendix 5. Follow-up table	223
	Appendix 6. Coding Charts workshop A	233
	Appendix 7. Coding Charts workshop B	239
	Appendix 8. Words-and-arrows Lessons Learned	247
	Appendix 9. Words-and-arrows Policy proposals	253
	Appendix 10. Causal Loop Diagrams notation (Source: Videira et al. 2014)	257

List of Figures

Figure 2.1 Levels to assess food security (Source: Thompson & Mets, 1999 in Giraldo et al., 2008)	6
Figure 2.2 The changing nature of key research issues and frequently asked questions at a range of different scales moving from crop production to food security (Source: Gregory et al., 2005)	6
Figure 2.3 Ten facts about hunger in Zambia (Source: World Food Programme, 2015)	8
Figure 2.4 Food security and food categories in Zambia throughout a year (Source: Saldarriaga et al., 2014)	8
Figure 2.5 Uncertainty vs. complexity of scenarios (Source: Zurek & Henrichs, 2007)	12
Figure 2.6 Backcasting, forecasting and scenario planning approaches (Source: Backcast Partners, n.d.)	15
Figure 3.1 Overview of research process and deliberative and analytical steps	27
Figure 3.2 Overview of the workshops 1 and 2 and their outcomes	27
Figure 3.3 Research questions and analytical framework of conceptual knowledge change in the course of a systems thinking group intervention using qualitative system models (Source: Hager et al., 2015)	28
Figure 3.4 CLD as a workshop starting point (Source: Hager et al., 2015)	29
Figure 3.5 Scenario Workshop methodology steps (Adapted from Kallis et al., 2009)	30
Figure 3.6 Scenario visioning Workshop steps of the case study	30
Figure 3.7 Places to intervene in a System (Adapted from Meadows 1999)	35
Figure 4.1 Chibombo District in Central Province, Zambia, Africa (Adapted from Wikimedia, n.d.)	37
Figure 4.2 Chitumbo Village (Source: Kopainsky, 2016)	38
Figure 4.3 Map of agro-ecological zones in Zambia (Source: Mercy Corps AgriFin Accelerate, 2017)	39
Figure 4.4 Map of participant's causal chain descriptions shared in three interviews following workshop 2015 (Source: Hager et al., 2015)	41
Figure 4.5 Participants by gender – A and B workshops	42
Figure 4.6 Participants by age – A and B workshops	43
Figure 4.7 Participants by marital status – A and B workshops	43
Figure 4.8 Participants by level of education – A and B workshops	44
Figure 4.9 Participants by income classification – A and B workshops	44
Figure 4.10 Scenario Workshop – Glasses of Water activity (Revision of the workshop 2015) ..	47
Figure 4.11 Participants discussing policy proposals to overcome the scenario “no rain, no government help”	47
Figure 4.12 What to do with cash CLD – Lessons Learned	50
Figure 4.13 How to increase/decrease cash CLD – Lessons Learned	51
Figure 4.14 How to get food CLD – Lessons Learned	52
Figure 4.15 How to improve land fertility/farming CLD – Lessons Learned	53
Figure 4.16 How to increase livestock CLD – Lessons Learned	54
Figure 4.17 Lessons Learned Final Causal Map (workshops A and B – April 2016)	55
Figure 4.18 Charcoal Business policy proposal CLD – Strengthening policies	58
Figure 4.19 Livestock Business policy proposal CLD – Strengthening policies	59
Figure 4.20 Groundnuts Business policy proposal CLD – Strengthening policies	62
Figure 4.21 Gardening policy proposal CLD – Strengthening policies	63
Figure 4.22 Loan policy proposal CLD – Strengthening policies	64
Figure 4.23 Piecework policy proposal CLD – Strengthening policies	65
Figure 4.24 Land (productive land) policy proposal CLD – Strengthening policies	67
Figure 4.25 Rental Business policy proposal CLD – New policies added	68
Figure 4.26 Partnership policy proposal CLD – New policies added	70
Figure 4.27 Legislation for Deforestation/Afforestation policy proposal CLD – New policies added	71
Figure 4.28 Retention Basins/Drilling Boreholes policy proposal CLD – New policies added	73
Figure 4.29 Policy Proposals Final Causal Map	74
Figure 4.30 Diagram from the results from the cross-impact matrix (Table 4.4)	76
Figure 4.31 Vertical Action Plan	84

List of Tables

<i>Table 2.1 Comparison of three deliberative visioning methods (Source: Kallis et al., 2009)</i>	<i>11</i>
<i>Table 2.2 Review of Scenarios and Visioning studies for assessing Food Security issues</i>	<i>17</i>
<i>Table 2.3 Review of SD Modelling applications for assessing Food Security issues</i>	<i>21</i>
<i>Table 2.4 Review of applications using Mixed methods approaches</i>	<i>25</i>
<i>Table 3.1 System Thinking workshop 2015 phases (Adapted from Hager et al., 2015)</i>	<i>29</i>
<i>Table 3.2 Follow-up table</i>	<i>32</i>
<i>Table 3.3 Summary of coding process (Source: Kim & Andersen, 2012)</i>	<i>33</i>
<i>Table 3.4 Coding Chart example (Adapted from Kim & Andersen, 2012)</i>	<i>34</i>
<i>Table 3.5 Words-and-arrows diagrams of causal arguments example (Adapted from Kim & Andersen, 2012)</i>	<i>34</i>
<i>Table 3.6 Cross-impact matrix method example (Adapted from Videira et al., 2014)</i>	<i>36</i>
<i>Table 4.1 Characterization of participants in the scenario workshops in Zambia, in 2016</i>	<i>45</i>
<i>Table 4.2 Summary of the activities in workshops A and B</i>	<i>46</i>
<i>Table 4.3 Legend CLD/Maps</i>	<i>49</i>
<i>Table 4.4 Cross-impact matrix for the policy proposals (Adapted from Videira et., al 2014)</i>	<i>75</i>
<i>Table 4.5 Outline of the policy proposals pathways</i>	<i>78</i>
<i>Table 4.6 Follow-up actions during the semester following the workshop</i>	<i>85</i>
<i>Table 4.7 Follow-up actions taken by P05</i>	<i>87</i>
<i>Table 4.8 Follow-up actions taken by P18</i>	<i>88</i>

Glossary and Abbreviations

AGORA	microfinance operator-investor that builds microfinance institutions in frontier markets
BAU	Business-as-usual
CFU	Conservation Farming Unit
Chibwantu	Fermented maize drink
CIN	Conversation Identification Number
CLD	Casual Loop Diagram
DAPP	Development Aid from People to People
DV	Deliberative Visioning
FAO	Food and Agriculture Organization
FISP	Farmer Input Support Program
FRA	Food Reserve Agency
GMB	Group Model Building
GT	Grounded Theory
HDI	Human Development Index
IFRCRCS	International Federation of Red Cross and Red Crescent Societies
ISA	Integrated Sustainability Assessment
Kapenta	Fish
LP	Leverage Point
MIN	Map Identification Number
MM	Mediated Modelling
Nshima	Maize flour
OSAWA	Own Savings for Asset and Wealth Creation
PRA	Participatory action research
R-SNDP	Revised Sixth National Development Plan
Samp	Ground Flours
SD	System Dynamics
SSA	Sub-Saharan Africa
TB	Tuberculosis
UN	United Nations
UNDAF	United Nations Development Assistance Framework
WFO	World Food Programme

1. Introduction

1.1. About the topic

Food security is a worldwide problem that has called the attention of governments and the scientific community, affecting, in particular, the developing countries (Giraldo et al., 2008). Food security exists “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (Food and Agriculture Organization, 1996). This term was introduced in the World Food Conference in 1974 (Giraldo et al., 2008). Rosegrant et al. (2003), global food security will remain a worldwide concern in the next 50 years and beyond; moreover, the eradication of extreme poverty and hunger was included as one of the 17 United Nations Sustainable Development Goals in 2015.

Food crisis has been part of the food history since early antiquity. Modern crisis, for instance, the international food crisis that occurred during the 70s, the 2007-2008 food security crisis and the period that we are currently experiencing are of a very different nature. They generally are not crisis due to food shortages, as global food availability is largely sufficient to feed all the world’s population, and the infrastructure is in place to bring commodities to the areas where there may be a localized shortage. Rather, current crises are related to food access for a mass of people who live in poverty and do not have enough resources to purchase the food they need (Maetz, 2012).

In 2006, 39 countries in the world were considered in an emergency state, due to their food insecurity, where 25 were in Africa, 11 in Asia and Near East, two in Latin America and one in Europe (FAO, 2006). Between the years 2012 and 2014, more than 805 million people in the world were considered undernourished, where almost 791 million were from developing regions (FAO, 2014). To achieve food security, there is a very complex path that involves not just the capacity of farming but also a constant adaptation to natural phenomena. The capacity of farming can be related to agricultural technology, tillage methods, storage capacity, among others. Whereas, the natural phenomena are influenced by climate change, for example, rainfall patterns and oscillation of temperature (Mapfumo et al., 2013).

Zambia is a Sub-Saharan country where agriculture faces challenges due to the climate change, so the food security in this country is not guaranteed (Saldarriaga et al., 2013). According to Mapfumo et al. (2013), the limitation of knowledge and access to information and technologies, restrict the capacity of local farming communities to respond and adapt to climate change issues.

While there has been considerable progress in understanding the sensitivities of crop yield to climate change, assessments of climate change effects on food security remain rather limited (Gregory et al., 2005). It has been proven that anticipation of risks and adaptation guidelines increase the capacity of adaptation to such complex events. However, evaluations of adaptive capacity related to climate change are normally mainly focused on the public sector, forgetting the individuals and private sector (Glaas et al., 2015). Moreover, climate change adaptation is primarily considered as a local

phenomenon, which therefore largely requires local responses (Mapfumo et al., 2013). Stakeholders involvement at all levels, from governments to local populations, is crucial to develop better strategies at the community scale. They can be involved in mainly two different ways: individual in-depth interviews and workshop group activities (Kok et al., 2006).

To achieve food security, or to develop a better future in general, it is necessary to be able to imagine it and, therefore, scenarios workshops can play a crucial role in such processes. Scenarios are considered an effective tool because they can synthesize and communicate information in a graphic and attractive form (Alcamo, 2001). Scenarios workshops involve different stakeholders in order to deliberate policy pathways (i.e. action plans) to achieve their goals. This mechanism has the power of evaluating various possible future events, thus the development of policies for those situations (Kallis et al., 2009). Moreover, the data usually extracted from scenarios are qualitative, which offers an important source for building simulation models in system dynamics (SD) through a coding process (Kim & Andersen, 2012). SD tools, namely participatory SD modelling, may also support decision-making process and the formulation of strategies, helping to study and integrate knowledge in complex systems through causal loop diagrams (CLD) (Hager et al., 2015). Even though these methods complement one another, they are rarely used together (Olabisi et al., 2010). Considering this gap and the benefits mixed-methods can bring, it is relevant to develop more studies combining these two methods regarding food security.

Within this context, this study aims to explore the combination of these two methods – scenario workshop and participatory SD modelling – in order to involve smallholder farmers from a developing country, who do not normally have an active voice in decision-making and development of strategies. The research also intends to fill the literature gap regarding the combination of these two methods; and, lastly, the outcome of it.

1.2. Objectives and research questions

The main goal of this research is to explore how the use of mixed-methods – scenarios and participatory SD modelling – are capable of improving understanding and an integrative view of the system serving as a lever for supporting food security decision-making processes. With the combination of those tools, it is expected to anticipate and to be better prepared for future events, thus increasing the adaptation capacity. The central questions guiding the current research are:

- How can visioning and participatory SD be used together to study plausible futures of food security involving smallholder farmers in developing countries?
- What are the possible policy pathways to avoid undesirable situations and to stimulate desirable ones, in a context of subsistence farming in Sub-Saharan African countries?

The pursuit of these research questions and the resulting insights are expected to contribute to enhancing and enriching the set of tools available for a holistic and inclusive analysis of food security

and the design of corresponding policy options, by integrating scenarios and participatory SD modelling approaches. The questions will be addressed with the analysis of a case study developed in Zambia.

1.3. Organization of the thesis

The thesis is structured in the following five main chapters:

- 1) Introduction: Consists of the framework of the research, underlying the food security problem in the world and sub-Saharan Africa, namely in Zambia; and the methods under study, which are visioning and system dynamics in a participatory workshop. Furthermore, it contains the objectives and research questions, and a synthesis of the thesis organization;
- 2) Literature Review: Presents the relevant literature and theoretical principles of the study which are: food security in developing countries and in Zambia; visioning, scenarios and backcasting; participatory system dynamics modelling; and mixed-method approaches. The last three topics are methodologies that can be applied when studying food security, to illustrate this, relevant studies were reviewed in the context of food security;
- 3) Methods: Presents the methodology used in each stage of this research: data collection and analysis – System Thinking (ST) workshop, in 2015, preparation of the scenario visioning workshops in 2016, workshops and data collection; and data processing and analysis – coding method, cross-impact matrix, outline policy proposals pathways, action plan and follow-up;
- 4) Results and discussion: presents and discusses the outcomes of the study. Firstly, the presentation of the case study. Subsequently, the results that are based on the workshops conducted in Zambia in 2015 and 2016 and their data processing and analysis.
- 5) Conclusions: The last chapter presents the conclusions, including a critical review of the developed work and the obtained results. It also contains suggestions for future research.

2. Literature Review

2.1. Food Security in developing countries

Food systems are complex and dynamic systems, involving biophysical and social factors linked through feedback mechanisms, including all the activities involved in the production, processing, transport, and consumption of food. These mechanisms influence systemic outcomes, namely food security, environmental and social welfare over time (Saldarriaga et al., 2014; The Oxford Martin Programme on the Future of Food, n.d.).

According to Saldarriaga et al. (2014) and Gregory et al. (2005), food security can be described through the behaviour of food availability, access to food and utilization of food; if one of them is stressed, food security is diminished. Food availability refers to the amount, type and quality of food a unit has at its disposal to consume, either through local production, distribution, or exchange of money, labour or other items of value. Access to food is how each consumer can afford available food and if they have the possibility to meet their food preferences; 'preferences' is here interpreted as food that is socially and culturally acceptable and consistent with religious and ethical values (Pinstrup-Andersen, 2009). Lastly, the utilization of food is the ability to consume and benefit from food, nutritional and social values of safety.

Food security assessments are made to understand how severe food insecurity is and the reasons why, determining if there is a need for an intervention, and also helping to predict upcoming food insecurity levels or the duration of an insecure food period. These assessments focus on some parameters, such as how people try to maintain a secure food environment for themselves, and whether they succeed, how people make their living, how they meet their food needs, what resources they have available, and who can access these resources and whether this access changes over time (IFRCRCS, 2006).

Food security can be analysed at different levels: national, household, and individual. These levels should be analysed separately since, for example, if a country which is considered food secure, it does not mean that the household level is also food secure. National food security is used to measure the extent to which a country has the means to make available to its people the food needed or demanded, irrespective of whether the food is domestically produced or imported. Meanwhile, a household is considered food secure if it has the ability to acquire the food needed by its members to be food secure. At last, individual food security results in good nutrition depending on a set of non-food factors such as sanitary conditions, water quality, infectious diseases and access to primary health care. Thus, food security does not assure nutritional security. Figure 2.1 presents the related factors of food security expressed in terms of supply, demand and stability related to national needs (Thompson & Metz, 1999 in Giraldo, et al., 2008; Pinstrup-Andersen, 2009).

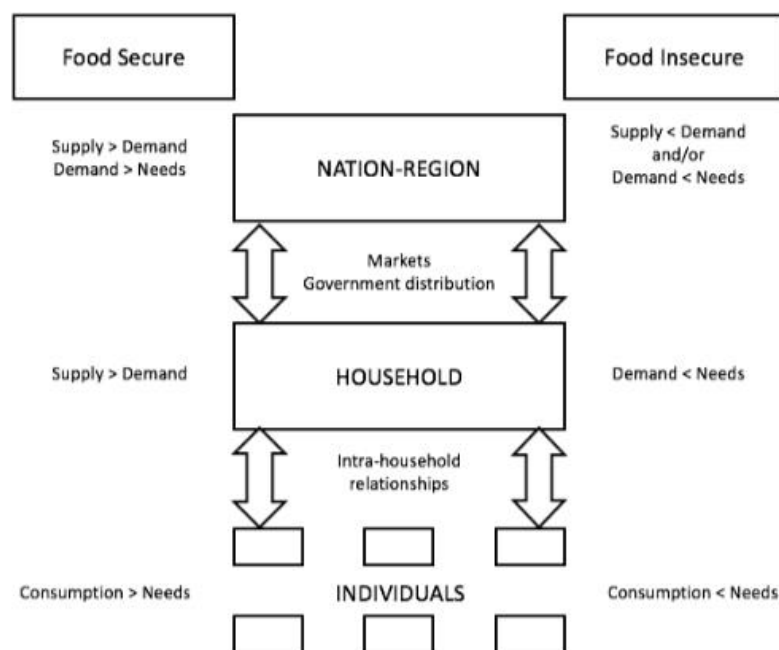


Figure 2.1 Levels to assess food security (Source: Thompson & Mets, 1999 in Giraldo et al., 2008)

As reported by Gregory et al. (2005), food security depends on robust food systems that comprehend issues of availability, access and utilization, not merely production alone, and consequently, the nature of key research issues changes as questions more related to food security are formulated (Figure 2.2). Surveys with a set of questions addressed to potentially food insecure households are often used to estimate food insecurity scores, through statistics (Coleman-jensen et al., 2014; Pinstруп-Andersen, 2009).

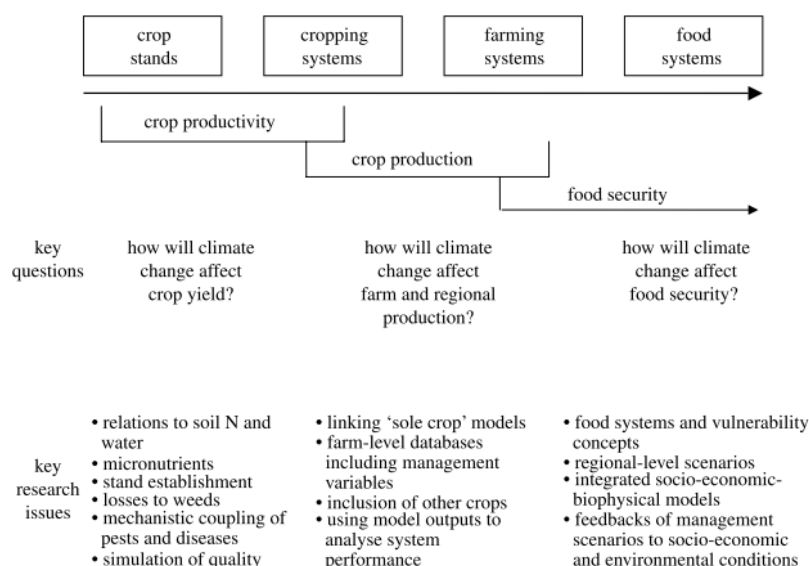


Figure 2.2 The changing nature of key research issues and frequently asked questions at a range of different scales moving from crop production to food security (Source: Gregory et al., 2005)

Urbanization and globalization are causing rapid changes to food systems, which increases stakeholders' needs for adaption to continuous change, especially when it combines growth and more demanding population, among exogenous causes, such as climate change (Gregory et al., 2005; Hager et al., 2015; Saldarriaga et al., 2014). Even so, food systems are not equally vulnerable to environmental changes because the capacity to cope with existing variability in biophysical and socio-economic systems differs from the ability of humans to perceive environmental changes and to adapt food systems (Gregory et al., 2005).

In developing countries, climate change has a large influence on several dimensions, such as economics, politics and agriculture. In warmer or tropical countries, climate change may result in more intense rainfall events between prolonged dry periods, as well as reduced or more variable water resources for irrigation, promoting pests and diseases on crops and livestock, likewise soil erosion and desertification (Rosegrant & Cline, 2003; Vervoort et al., 2014). Climate change events not only can affect the crops productions but also can bring diverged actions and interests from stakeholders, affecting all the food system, for instance, changes in the market and food prices that can restrict the access to food from low-income populations (Gregory et al., 2005). Another big challenge to food security is that 95% of morbidity and mortality cases associated with human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) are in developing countries, reducing the capacity of the affected population to work and produce or buy food (Rosegrant & Cline, 2003).

The relative importance of climate change for food security differs between regions. For instance, in southern Africa, the climate is among the most frequently cited drivers of food insecurity because it acts both as an underlying, ongoing issue and as a short-lived shock. For this reason, the policies to assure food security should be studied specifically for each region (Gregory et al., 2005). As it was mentioned before, Zambia is a country which faces food insecurity, where 11% of the population in 2016 was considered food insecure (Food Security Information Network, 2017), Figure 2.3 indicates the ten facts that shed light on the hunger situation (World Food Programme, 2015).

As reported by Saldarriaga *et al.* (2014), farmer's food security in a household dimension is diversified during the year, as well as their food categories (Figure 2.4). The period where farmers assure more food security is normally from March until April, however, this period can last longer depending on the previous rainfall patterns. In the beginning of March, some of the farmers affirm having enough food for consumption. During the period from August until October, there are farmers who need to start harvesting for their consumption, while others still have food for those months. The period from February to March is considered critical, since some of the farmers barely had enough food, because of the late harvest in the present year and a reduced production in the last year. Finally, the variety of food available is generally considered poor and the season which has the most variety of food and most secure is the cold one (see "mupeyo" in Figure 2.4).



Figure 2.3 Ten facts about hunger in Zambia (Source: World Food Programme, 2015)

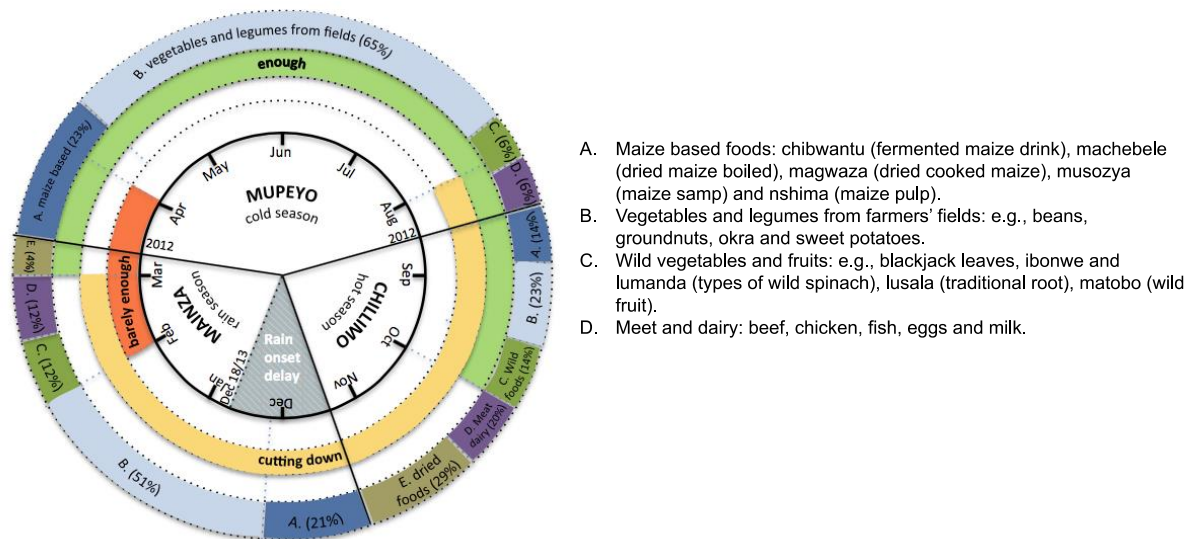


Figure 2.4 Food security and food categories in Zambia throughout a year (Source: Saldarriaga et al., 2014)

In Zambia, the farmer's nutrition is based mainly on maize foods during the year, even though they do not have much diversity. Wild vegetables and fruits also make part of the dietary of farmers in Zambia, but on a smaller scale than maize. Nevertheless, farmers having livestock are more likely to do livestock business in order to pay personal expenses, instead of using them for consumption (Saldarriaga et al., 2014).

Moreover, households in Zambian areas that experience lower than average rainfall have lower levels of daily caloric intake as well as lower food and non-food expenditures. A recent cash transfer programme aimed to support 20 000 ultra poor households, helping to mitigate the negative effects of climate shocks on food security, but it was not sufficient to fully overcome them (FAO, 2016).

Achieving food security needs robust policy and investment reforms on multiple fronts. This invokes the necessity to engage all stakeholders, from different levels and sectors, in decision-making processes, not only for giving voice to the disadvantaged community but also to increase their knowledge (Gregory et al., 2005; Rosegrant & Cline, 2003; Vervoort et al., 2014). Moreover, the combination and integration of different types of knowledge and education, such as intuitive, traditional and science-based, benefits the implementation of strategies to achieve food security (Saldarriaga et al., 2013). Nevertheless, there is a lack of tools or methodologies suitable for assessing the effects of long-term policies in tool systems and a shortage of holistic system models to facilitate intervention and understanding at the subsistence farmer's level (Giraldo et al., 2008; Guma et al., 2016).

System Dynamics (SD) is an example of an approach which can help the process of gaining knowledge in order to analyse food systems. When using a modelling process it is possible to study and integrate knowledge in those complex systems to assist in a decision-making process (Hager et al., 2015). According to Oyo et al. (2016) and Giraldo et al. (2008), many researchers and institutions have built models for projecting and predicting global food security, focusing on the future demand for food, supply and variables related to food systems at different levels.

Usually, the models developed around food security use correlations to explain relationships, but the introduction of a systemic approach is arguably preferred in their formulation, and the reasons are: helping to understand the structural causes of a certain issue; the focus on causation between variables; and the evaluation of policies and their long-term consequences. Such SD models can be designed to allow the user to analyse and manipulate its internal structure as well as to study the relationship between the structure and the behaviour of the model (Giraldo et al., 2008).

2.2. Visioning, scenarios and backcasting

Visioning, scenarios and backcasting are all considered prospective methods, i.e. tools to study and analyse “forward views” or “images of the future”, which are related to each other and can be used for the same study purpose (Voros, 2006). Foresight tools assist the exploration of the future possibilities, deliberating their opportunities in order to develop policy strategies (Featherston & Doolan, 2005). Voros (2006) states that prospective methods can be classified by their “modes of thinking”, such as evolutionary methods, in which the development is considered relatively continuous from a starting point; and/or revolutionary methods, that the evolution is essentially discontinuous and disruptive, without a mandatory association between the starting point. The next sections will further explain each approach.

Visioning

Visioning is considered a key method in sustainability research and problem-solving, for instance in transformational sustainability science or in planning for urban sustainability, having a strong presence in the early futures literature (Voros, 2006; Wiek & Iwaniec, 2013). Therefore, visioning can be used in activity planning, organizational change and to formulate an overarching development vision or strategy (Keller, n.d.).

Modern visioning approaches emerged during the 1980s and 1990s with the incorporation of systems thinking and participatory engagement (Wiek & Iwaniec, 2013). Deliberate Visioning (DV) is normally a two-staged method consisting of vision-making and action planning: the first one the stakeholders find a common vision about the subject requested, while in the action plan part participants discuss how to achieve that vision (Kallis et al., 2009). This approach stimulates stakeholders to envision new visions, without paying so much attention to the constraints of current reality, indicating that this is a revolutionary method (Voros, 2006).

Visions are a subgroup of scenarios (possible future states) and demarcated from predictions (likely future states). Furthermore, a vision is different from the pathway that leads up to the vision. Accordingly, visioning is the process of creating a vision, i.e., a representation of a desirable future state, as opposed to scenario building, forecasting and backcasting (i.e. pathways to desirable future states). Visions can be operationalized in specific (qualitative and quantitative) goals and targets (Wiek & Iwaniec, 2013).

Participatory visioning has different roles, such as psychologically, since participants deliberate and work together to find a desirable future which aims to motivate stakeholders; procedurally, because this method helps the mediation and to reach a consensus among the participants; it facilitates the analysis and evaluation of policies in an incorporated form; and, lastly, it bears the common objectives that can help designing pathways to achieve the desired vision (Kallis et al., 2009). Moreover, the visioning process should be implemented before decisions are made and after the problem and situation analysis (Keller, n.d.).

To promote the elaboration of collaborative visions, there are several available methodologies, such as scenarios workshops (SW), future search (FS) and community visioning (CV). A comparison of these methods is presented in Table 2.1 (Kallis et al., 2009).

Table 2.1 Comparison of three deliberative visioning methods (Source: Kallis et al., 2009)

Method	Tools	Deliverables	Duration	Participants	More info
SW	Scenarios Facilitated group discussion	Future Scenario Vision Statement Action Plan	2-2.5 days	Stakeholders 36 max	www.cordis.lu/easw
FS	Milestone map Mind map Facilitated group discussion	Vision statement Implementation programme and partnerships	2-2.5 days	Stakeholders 40-80+	www.futuresearch.net
CV	Community scanning Scenarios Indicators Facilitated meetings and sub-group committees	Civic index Vision statement Key performance areas Implementation plan	5 events (1-2 days each) and in-between work	Stakeholders and individuals 200+	www.ncl.org

As it is shown in the previous table, the DV methods differ in terms of the facilitation tools used, the number of participants and their duration. Nevertheless, they share a considerable advantage – all participants have the same rights, i.e. without respecting a hierarchy. This is considered a benefit because it blends knowledge, formal and informal, from stakeholders with different backgrounds (socially, economically, politically), which can lead to unforeseen visions and action plans (Kallis et al., 2009). Further benefits include participants' motivation and the assistance in building a common ground and developing written and visualised statements of a community's long-term goals and strategic objectives for sustainable planning (Keller, n.d.).

On the other hand, a shortcoming of these methods can be the influence of the organizers and facilitator in this process. The organizers and facilitators are fairly involved, for instance having the role to create the initial scenarios or mediating the activities, and by default, they can add their personal insights and preferences (Kallis et al., 2009).

According to Weisbord (1993) in Kallis et al. (2009), DV is perceived as a “fresh, level playing field where policy-makers, powerful interested and weaker or marginalized groups are equal partners, willing to take up innovative actions that breakthrough past quo”. Alternatively, cited by Kallis et al. (2009), there are some other authors who do not believe in this concept, affirming that DV can lead even to conflicts between stakeholders.

Scenarios

The name ‘scenario’ in theatre mentions the sequential projections and actions in the back part of the stage, which interact with the actors in a scene. The meaning ‘scenario’ in this dissertation is not far away from the earlier definition but has some other particularities: they can be considered images of alternative futures. This does not mean that these are the most probable, so they are not considered

predictions of the future (Alcamo, 2001). As said by Voros (2006), this method is contemplated as the “best-known of prospective methods”, probably because it requires narrative and visual forms, which increases human predisposition to remember them.

Scenario-based approaches are particularly useful when addressing the considerable uncertainty about future trajectories in complex systems (Figure 2.5). Moreover, scenarios can serve a range of different purposes: science and research, education and information, strategic planning and decision-support. Within science and research, for example, scenarios can help explore the understanding and dynamics of a system by exploring the interactions and linkages between key variables or driving forces as the scenario plays out. In the wider context of education and information, scenarios can provide a useful tool for ordering, conveying and/or illustrating different perceptions about alternative future environments. Lastly, scenarios may highlight upcoming choices to be made and their long-term consequences, supporting strategic planning and decision-making (Zurek & Henrichs, 2007).

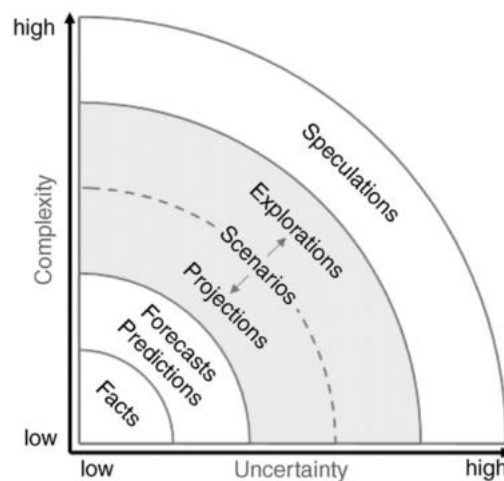


Figure 2.5 Uncertainty vs. complexity of scenarios (Source: Zurek & Henrichs, 2007)

The scenarios methodology is grounded in system sciences (Vervoort et al., 2014) and should represent a plausible and a pertinent set of perspectives of the future, i.e. possible future states, not just one desirable or undesirable vision (Alcamo, 2001; Wiek & Iwaniec, 2013); which is the major difference when it is compared to visioning that just considers a single vision (Voros, 2006). With the development of this tool, it is possible to materialize mental models, analyse them, and explore their uncertainties (Featherston & Doolan, 2005). Generally, scenario-construction techniques are categorized as an evolutionary method due to its continuous process (Voros, 2006) and, at the same time, are particularly useful in a context of unpredictable and uncontrollable events which could modify the future state of a system (Olabisi et al., 2010).

The main objectives of scenario planning are to adjust mental models of decision makers, having the possibility to consider other new perspectives, generating a shared language and models, developing the ability to translate expert opinion into a format comprehensible also to non-experts and so to

stimulate the debate and systemic thinking among them, in order to develop policy and planning strategies. Furthermore, scenarios have the potential of being a less rigid and more open method of exploring the future (Featherston & Doolan, 2005; Hojer & Mattsson, 2000; Olabisi et al., 2010).

This tool has many benefits for environmental studies. Namely, it can create awareness about the future; provide images from the alternatives policies pathways and study their strengths and weakness; it can also combine qualitative and quantitative information and can represent both forms of data; lastly, it can be used to help stakeholders to reach a decision. Pursuant to Featherston et al. (2005), "scenario planning relies on an understanding of today to explore what might happen in the future". Scenario workshops are a manner to involve stakeholders, opening up the possibility to create a common vision, motivate social interaction and debate, building and integrating knowledge by consulting local experts, which may boost new and different points of view when combining different types of knowledge (Kanter et al., 2016; Kok et al., 2006).

Scenarios have many forms, that are chosen depending on the purpose of each scenario exercise – 'quantitative' vs. 'qualitative', 'base-line' vs. 'policy scenarios' or, even, 'exploratory'/'descriptive' vs. 'anticipatory'/'prescriptive'.

'Qualitative' scenarios, as the name implies, are expressed by words or visual symbols, they can be represented usually by storylines, but also diagrams, sentences or outlines. As this type of scenario is not represented by numbers, qualitative scenarios are considered less accurate than the quantitative ones. However, this type of scenario has benefits such as the fact that they are very accessible and easy to understand for any kind of stakeholder and they can represent several insights at the same time. On the other hand, 'quantitative' scenarios take the shape of graphs and tables with numerical data, which are more technical and objective due to the form of models' equations, inputs and coefficients. This type of scenario has some drawbacks, for instance, they tend to represent only one point of view about how the future will develop, they are based on assumptions of computer models and, lastly, this sort of scenario is not so accessible to understand by non-experts. Quantitative scenarios can be used to analyse the consistency of qualitative scenarios and normally they are frequently published in the scientific literature so they have to go through scientific evaluations and peer reviewing (Alcamo, 2001; Zurek & Henrichs, 2007).

Another useful way to classify scenarios is between 'exploratory'/'descriptive' and 'anticipatory'/'prescriptive' types. The first type mentioned is when a scenario starts in the present and explores leanings into the future, describing in words, numbers and/or images (Vervoort et al., 2014); while the second, also known as 'normative' begins in a suggested vision of the future and then come back to the present to visualize how this future could develop, the vision of the future can be both positive or negative and even neutral. In addition, exploratory scenarios claim fewer assumptions about the future than the anticipatory ones (Alcamo, 2001).

Furthermore, there is another way to classify scenarios: 'base-line'/'business-as-usual (BAU)' or 'policy scenarios'. The 'BAU' scenarios describe the future alternatives without any intervention of a new policy, which is very useful to detect policies that could be implemented in the current time and after to compare and study the efficiency of those policies. In contrast, 'policy scenarios' portray the future effects of defined policies (Alcamo, 2001).

All of the above types of scenarios related to environmental studies can act as a bridge between science and policy, consisting of five principal elements: description of the step-by-step changes; driving-forces; base year; time horizon and steps; and also, a storyline. The first element describes the step-wise changes that what will occur in the future condition, which can be represented by a diagram, for example. The driving-forces are factors that originate pressures which will influence a state that will lead to an impact in the system, for instance, the driving-forces of food insecurity can be population or climate change. The 'base year' indicates which year the scenario starts. The 'time horizon' is the length of time included in the scenario, while the 'time steps' are the number of time periods between the base year and the last one. This time horizon often varies depending on the objectives of a scenario. Finally, the storylines are narratives that describe what may happen in each scenario including the driving-forces and other scenario characteristics (Alcamo, 2001; Zurek & Henrichs, 2007).

In consonance with Kallis et al. (2009) "scenario-discussion and visioning involves deliberation over general aspirations and desirable future images, but not detailed analysis of their feasibility", and Featherson et al. (2005) "the literature of scenario planning offers little in the way of guidance about how this can be done". According to Olabisi et al. (2010), scenario techniques have other challenges: they are difficult to compare due to their qualitative nature, they can be disconnected from quantitative information about trends or patterns which have influence over future conditions.

Backcasting

The Backcasting method was developed in the late 1970s used as a normative future study in the energy area. Since then, this tool is used also for studying and planning sustainability, transportation, conservation, spatial planning, among others (Brunner et al., 2016). Nevertheless, according to Kanter et al. (2016), sustainability studies using this tool have been mainly focused on the energy sector and greenhouse emissions, being few related to agriculture and food sector, deserving further exploration. In the year 1974 backcasting was described as the "most common approach to practical statistical forecasting" (Gold, 1974).

This approach first creates a future normative vision and then comes backwards in time towards the present to detect how this vision could be reached and proceeds to build an action plan – policies, pathways, follow-up activities – to meet that desirable version of the future (Kanter et al., 2016; Robinson, 1982). With a special focus on the importance of systems thinking and motivation, this approach also emphasizes the role of team learning and shared leadership in corporate visioning (Wiek & Iwaniec, 2013). Moreover, this tool enables users to define solutions, priorities and necessary steps to achieve the desired vision, being more concerned with how desirable futures can be attained (Kanter

et al., 2016; Robinson, 1982).

On the other hand, backcasting has shortcomings, such as practical backcasting yields forecasts which have never been tested through comparison with subsequent actual outcomes, leading to assumptions and consequently gaps; when looking backward some data points can be considered 'unrepresentative' and, hence, to be ignored; it is not possible to cover some abnormal events, for example, strike and wars, that can totally change the paths; it is not likely to use backcasting as an ostensibly neutral justification for policy decisions; and, lastly, backcasting analyses cannot play the same legitimizing role that predictive analyses do, since the former does not show what will happen but what might happen, given certain conditions and choices (Gold, 1974; Robinson, 1982, 1988).

Backcasting is considered, as reported by Voros (2006), a mixed prospecting method since they are considered revolutionary but also evolutionary. This prospecting nature is revolutionary because normally starts involving a visioning method (revolutionary), and after the creation of continuous pathways to achieve the vision, i.e. evolutionary. Likewise scenarios, they can be considered normative or explorative. Both types may be used in conjunction, to evaluate the feasibility of policies, plans and strategies (Vervoort et al., 2014).

When backcasting methods are compared to forecasting the main difference is that the first one indicates the relative consequences and viability of diverse policy goals instead of showing how the future is expected to be, while the second uses quantitative models to predict the future based on trends of the past and present (Kok et al., 2006; Robinson, 1982). Another difference is that a good backcasting originates divergent alternatives, i.e. multiple futures from a common present; while a good forecasting converges to the most likely future and studies its level of possibility (Robinson, 1982). Besides, backcasting is a method which is closely connected to the purposes of the policy, making it more of an appropriate tool for policy planning, which may also be used as a complementary tool for forecasting scenarios (Brunner et al., 2016; Kanter et al., 2016; Robinson, 1982). Lastly, when both methods are iterated is called middlecasting (Kok et al., 2006). Figure 2.6 illustrates how forecasting, scenario planning and backcasting approach.

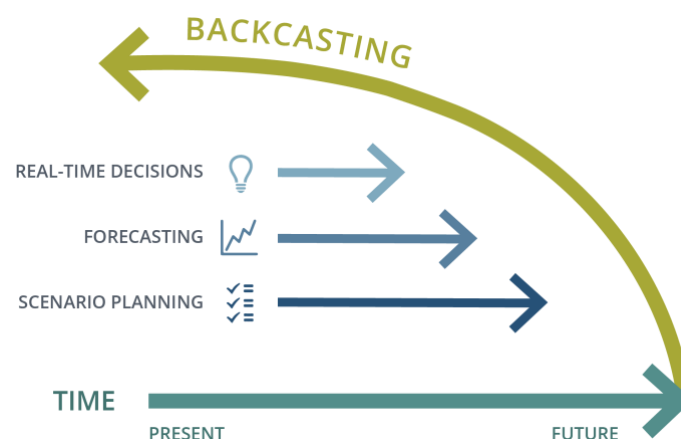


Figure 2.6 Backcasting, forecasting and scenario planning approaches (Source: Backcast Partners, n.d.)

Table 2.2 presents a review of these approaches assessing Food Security issues, summarizing the research goals, methods and outcomes. In some of the studies, the material results were not explicit in the reviewed literature, just the methodological process and its outcomes, for instance in Metson et al. (2016) and Mapfumo et al. (2012). Table 2.2 also contains studies using visioning.

The three studies aim different objectives and also use different methods, however, the three case studies work and have the participation of stakeholders. Mapfumo et al. (2012), aims to investigate how Participatory Action Research (PAR) methodology, which is characterised by iterative planning-action-reflection cycles, combined to a field-based farmer learning centres, can increase the adaption capacity of smallholder farmers to climate change. Being that, one of the exercises was visioning, which showed that smallholder farmers could associate concepts in order to build an action plan. On the other hand, Kanter et al. (2016) used the backcasting method to build an action plan regarding the Uruguay's beef sector, in order to develop policies according to Sustainable Development Goals (SDGs). Lastly, Iwaniec et al. (2016) have interactive workshops and group learning, in order to explore visions, scenarios and pathways of social transformations towards food and water security related to phosphorus. The variety of this literatures subjects and the way the studies were conducted, show that scenarios, visioning and backcasting are flexible methods which can help the involvement of a large variety stakeholders.

Table 2.2 Review of Scenarios and Visioning studies for assessing Food Security issues

Study title	Authors	Local	Research objective(s)	Methods description	Outcomes
Participatory action research (PAR) as an entry point for supporting climate change adaptation by smallholder farmers in Africa	Mapfumo, Adjei-Nsiah, Mtambanengwe, Chikowo and Giller (2012)	Sub-Saharan Africa – Ghana and Zimbabwe	Investigate the potential of PAR methodology (iterative plan-action-reflection cycles), coupled with a new concept of field-based farmer learning centres to build adaptive capacity of smallholder farmers to climate change	<p>The sequence of methods was the following:</p> <ol style="list-style-type: none"> 1. Diagnosis of agricultural problems and sources of vulnerability to climate change 2. Understanding problems linkages and prioritizing adaptation options with communities 3. Analysis of the issues by the communities <ul style="list-style-type: none"> - during the first year: activities (drama, role plays) to communicate the stakeholders' current situations versus desired changes. - Experimentation and sharing of knowledge on soil fertility management - Workshops with stakeholders to explore potential action points for climate change adaptation 4. Implementation and evaluation of prioritised adaptation options 	<p>From the visioning activities, the stakeholders could associate:</p> <ul style="list-style-type: none"> • Combination of declining soil fertility, poor seasonal rainfall distribution and droughts were major factor undermining food household security • Conflicts between the stakeholders • Declining soil fertility was in the core of the community conflicts <p>The PAR methodology was considered successful in this case study</p>
Translating the Sustainable Development Goals into action: A participatory backcasting approach for developing national agricultural transformation pathways	Kanter, Schwoob, Baethgen, Bervejillo, Carriquiry, Dobermann; Ferraro, Lanfranco, Mondelli, Penengo, Saldias, Silva and Lima (2016)	Uruguay	Present backcasting approach and methodological toolkit for countries to develop policy roadmaps towards 2030 using local tools and expertise that could help transform national agricultural sectors in line with the Sustainable Development Goals (SDGs) through the case study of Uruguayan beef sector as a case study	<p>Methodology:</p> <p>Participatory approach involving key stakeholders (farmers, government, academia) making use of local tools and expertise to develop realistic targets that are consistent to SDGs and Backcasting method to build an action plan with pathways that meet those targets</p> <ol style="list-style-type: none"> 1. Selection of indicators (environmental, agronomic, socioeconomic) that can be used to evaluate and to monitor the progress in the agricultural sector, through several debates with stakeholders 2. Determinate the indicators current values and determine the 2030 target ones 	<p>Set of targets for Uruguay's beef sector in line with the SDGs which can be used for developing policies, through the involvement of different types of stakeholders – strategic matrix for transformation of Uruguay's beef sector (targets, levers and roadblocks).</p> <p>"This case study marks the beginning of a new approach to achieving sustainable development goals in the agricultural sector"</p>

Study title	Authors	Local	Research objective(s)	Methods description	Outcomes
P-FUTURES¹: towards urban food & water security through collaborative design and impact	Metson, Iwaniec and Cordell (2016)	Malawi, Vietnam, Australia and USA	Work with stakeholders to explore visions and pathways of social transformation towards food and water security related to phosphorus	<p>The study process was:</p> <p>Seed phase (6 months): create relationship among stakeholders and design a research approach to social transformations for the project. The workshops engaged more than 95 participants across the four local studies:</p> <ol style="list-style-type: none"> 1. Mapping the current situation and existing goals: sharing and understanding knowledge and common goals through facilitated system mapping activities 2. Vulnerability assessments: identify the vulnerabilities of each local study and aspects of the phosphorus challenge using the maps created before 3. Visions and pathways: develop participatory visions and pathways for sustainable food and water systems through the system maps <p>Asses implementation strategies: participants' envisioned implementation strategies</p>	<p>Seed phase outcomes:</p> <ul style="list-style-type: none"> • Build capacity for social transformation • Diverse stakeholder within a local learning from one another • Explore local vulnerabilities and desirable visions & pathways • Web-platform for public dissemination & partner sharing • Co-development of full proposal & transdisciplinary approach

¹ "P-FUTURES is a cross-city initiative designed to address phosphorus security challenges and opportunities, funded by the International Social Science Council Transformations to Sustainability programme" (Metson et al., 2016)

2.3. Participatory System Dynamics modelling

System Dynamics can offer a formal method to fill in what is missing in the visioning statements, advising scenarios, exploring, testing and informing systems in different scales through the development of models from the real system. SD is a problem-oriented multidisciplinary approach that explores the structure of a system and the causes for its behaviour, by incorporating positive and negative feedback loops and nonlinear relations between variables, which can also be used to construct preliminary hypothesis about the future through causal assumptions (Featherston & Doolan, 2005; Olabisi et al., 2010). The underlying concept of SD implies that the understanding of complex system's behaviour – such as national food insecurity – can only be achieved through the coverage of the entire system rather than isolated individual parts (Collin 1997 in Giraldo et al., 2008).

The misalignment between the objective reality and the subjective reality is the source of ineffective decisions, and SD attempts to improve decision making by making subjective mental models explicit and testable through simulation (Kim & Andersen, 2012). SD models are based on a set of discrete difference equations, i.e., differential equations with a fixed time step that are recursively solved, where the current state of a variable depends on the previous system state. Through these equations, it is possible to describe, analyse and simulate the macro-level behaviour of complex adaptive systems (Monasterolo et al., 2015).

In SD, Causal Loop Diagrams (CLDs) are used as one of the diagramming tools to capture the structure of systems. CLDs give a broad and flexible representation of the feedback structure of a model, using simple elements such as variable names and arrows representing causal links between two variables (Sterman, 2000). Causal links may be marked as positive '+' or negative '-', depending if variables change in the same ('positive link') or opposite ('negative link') direction. Feedback loops formed around two or more variables may be labelled as reinforcing ('positive loop') or balancing ('negative loop') (Videira et al., 2012). In other words, CLDs are an important tool for evidencing the hypothesis assumed in the model, it draws mental patterns and relevant feedbacks to problem solution which contains system elements relevant to the system (Guma et al., 2016).

Participatory SD modelling is the use of a SD perspective in which stakeholders or clients participate to some degree in different stages of the process, including problem definition, system description, identification of policy levers, model development and/or policy analysis (Stave, 2010). Therefore, participatory SD modelling approaches have potential to promote learning and co-production of knowledge and commitment towards the implementation of decisions, thus leading to an improved analysis of complex issues underlying environmental and sustainability decisions (Videira et al., 2012). There are two key approaches which promote the involvement of stakeholders in a SD process for environmental and sustainability issues: group model building (GMB) and mediated modelling (MM) (Stave, 2010). The GMB signals the intent to involve a relatively large client group in the business of model formulation and not just conceptualization (Richardson & Andersen, 1995). While MM is a

participatory tool for adaptive and collaborative management aiming to promote learning and consensus building among stakeholder groups (van den Belt, 2004 in Videira et al., 2012).

Olabisi et al. (2010) affirm that the process of building a SD model with the collaboration of stakeholders has a special importance during the participatory modelling approach since it facilitates the comprehension of the system under study and gives the possibility to test strategies by running the model. A simulation model explores the behaviour over time and analyses its changes when different policies and management are applied, generating interesting insights (Guma et al., 2016; Saldarriaga et al., 2014).

A typical SD model building process involves the following steps: defining system boundaries, identifying variables, the relations between them, and identifying feedback loops and leverage points (Olabisi et al., 2010); along all the steps: conceptualization, formulation, testing and implementation (Luna-Reys & Andersen, 2003 in Kim & Andersen, 2012). According to van den Belt (2004) in Olabisi et al. (2010) in some participatory SD, stakeholders with expertise in the system under study participate in the model building process and a facilitator guides participants through the model constructions so that they are able to influence the structure of the jointly developed model.

Participatory SD modelling may have some drawbacks, for instance when the models do not represent the views of those who designed them. Models may also be limited in their ability to reflect unexpected behaviour exogenous causes (Olabisi et al., 2010). The following table (Table 2.3) contains some studies where SD modelling was applied to assess food security issues, with and without stakeholders involvement

Bach and Saeed (1992), investigate the effect on the agricultural resource system of planned policies to maintain food self-sufficiency in a central-planned economy, through the use of a SD model, this was not a participatory SD modelling as the following cases, however, it describes how the model was manipulated to find the conclusions. Later, in 2014, Saldarriaga et al., focused on the stakeholders to develop the SD model, investigating the dynamic decision-making and their capacity to adapt. Finally, Guma et al. (2016) also involved the stakeholders' participation to study food security, followed by the simulation of the SD model built. Concluding, there is an evolution from not involving the stakeholders to the increase of their participation in the SD modelling; additionally, it is possible to recognize the importance of the participatory SD modelling to the studies and access to new perspectives.

Table 2.3 Review of SD Modelling applications for assessing Food Security issues

Study title	Authors	Local	Research objective	Methods description	Outcomes
Food self-sufficiency in Vietnam: a search for a viable solution	Bach and Saeed (1992)	Vietnam	Asses the effect on the agricultural resource system of the past and presently planned policies to maintain food self-sufficiency in a central-planned economy	SD model of the food production system incorporating relationships concerning population, food production and soil ecology. The values/parameters of the CLD were manipulated using computer simulation in order to study policies – testing the model	Short-run guide-lines to increase production appear to be detrimental to maintaining food security in a long-term: Sustainable food production – incorporate soil conservation and improvement, and population controls
Dynamic decision making in a coupled social – ecological systems. Smallholder farmers' goals, resources and constraints in improving food security and adapting to climate change in Zambia	Saldarriaga, Nyanga and Kopainsky (2014)	Zambia	Combining qualitative interviews with quantitative SD modelling in order to study farmers' dynamic decision making and their adaptive capacity regarding food security	<ul style="list-style-type: none"> • Focusing on smallholder farmers stakeholders, collecting interview data on the multiple decisions they make in the course of a year through the 'food security wheel' designed by the authors • Development of a SD model to support decision makers with reference to food security 	<p>Behaviour patterns of food security throughout the year and decisions based on it such as:</p> <ul style="list-style-type: none"> • Getting inputs, pre-tillage, tillage, liming; • Planting; • Weeding and spraying; • Harvest crops; • Drying and shelling maize; • Borrowing money; • Working off-farm; • Selling food crops; • Selling animals, buying food • Exchanging food.

Study title	Authors	Local	Research objective	Methods description	Outcomes
Household Food Security Policy Analysis: A System Dynamics Perspective	Guma, Rwashana and Oyo (2016)	Uganda	The study aims to investigate food security challenges and evaluate policies and intervention strategies for better livelihood at household level	Development of a SD model through the following steps: <ul style="list-style-type: none"> • Dynamic Synthesis Methodology (DSM) • Questionnaires • Interview guide Simulation and testing policies	<p>The model (composed by four sectors: population and land, food consumption, food production, and food sales) demonstrates a balance between food stock, seeds preserved, seeds for sale and consumption from crop harvest throughout the food cycles. The policy guidelines are:</p> <ul style="list-style-type: none"> • Utilize the scarce land resource • Advocate for food production oriented activities • Additional support to farmers • Promote and develop rural financial markets • Provision of credits for consumption stabilization <p>This research makes contribution to the literature by evaluating dynamic synthesis methodology and FS policy discussions from a feedback point of view</p>

2.4. Mixed methods approach

Both scenarios and participatory SD modelling approaches emphasize the dynamic and uncontrollable nature of complex socio-ecological systems and the significance of multiple feedback mechanisms. These two methods complement one another but are rarely used together (Olabisi et al., 2010).

As Tabara et al. (2008) claim that integrated sustainability assessment experiences show that new and more reflective tools are still needed to promote a systemic perspective on complex issues and focus more explicitly on social actors and agency. In order to reduce policy implementation failures and improve their formulation, participatory policy-making and assessment processes can be integrated (Videira et al., 2012), since these two techniques are particularly valuable for assisting communities in dealing with the consequences of natural resource use decisions over the long-term, given both anticipated and unanticipated changes (Olabisi et al., 2010).

According to Featherston et al. (2005), both methods described above share the same basic characteristics, which are mental models. Moreover, SD and scenario planning are also not considered static approaches, which make them useful to understand the causes of systemic behaviour in a developed system and explore the spaces it might proceed to in the future. Furthermore, the scenario planning and SD are knowledge-centred, i.e., the learning process is considered more relevant than its products, i.e., scenarios or models built during the process.

On the other hand, the major differences between these two techniques are the formality and objectivity of each other and the timeframes which they focus on. While SD is considered more objective, more formal addressing mental models and focuses more on the present system; scenarios are more subjective (which can lead to misinformation), more dedicated to informing mental models, and focuses on the events of the future often during a horizon between five to 25 years (Featherston & Doolan, 2005).

Ultimately, both methods can work together, as reported by Featherston et al. (2005) "Scenario planning's approach of mapping out a system and system dynamic's ability to specify the causes of behaviour observed within a system". Hence, they can complement each other and test stakeholders' ideas as it was mentioned before. The simulation modelling can outline scenarios in a quantitative form, inducing to a more concrete analysis, or test the consistency of participants' assumptions, for example (Vervoort et al., 2014). Additionally, scenarios have the capacity to accommodate external drivers while SD models frequently cannot (Olabisi et al., 2010).

In this dissertation, both methods are combined for the same purpose in order to potentiate and fill the above mentioned gaps. Table 2.4 represents the review of some other case studies related to the mixed method of these two approaches in the study.

Featherson et al. (2005), investigated the use of SD to inform scenario planning, through several workshops involving stakeholders. In this case, the participants had a scenario workshop which originates a CLD, this map was tested using the SD tools and compared to the reference modes. However, the authors found that this case may not have reaped the full benefit from integrating these methods and considered that the value of this study was the process, not its products. Olabisi et al. (2010) also combine methods, participatory SD modelling with scenario visioning, in order to build an action plan. In this case, the authors affirm that both methods can be used together and describe the advantages of this combination. Lastly, Videira et al. (2012) investigate the exploration of the use of qualitative SD tools and participatory modelling approach, generating positive outcomes such as the involvement of a representative group of stakeholders. From these three cases, it is possible to see the evolution over time, furthermore, these had similar methods and research objectives.

Table 2.4 Review of applications using Mixed methods approaches

Study title	Authors	Local	Research objective	Methods description	Outcomes
Using System Dynamics to Inform Scenario Planning – A case study	Featherston and Doolan (2005)	Australia	Investigate the use of SD to inform scenario planning and improve the rigour of the process. The case study is an organization for disable people. The scenario planning exercise was to explore the different possible visions for the future, in order to expand the capacity of the organization	<p>Workshops involving the stakeholders in order to gather information for building a SD model.</p> <ul style="list-style-type: none"> • 1st and 2nd workshops: identify and explore the trends and drivers of the organization and industry environments and scenarios development • 3rd workshop: map the system (CLD) from the scenarios exercise • 4th workshop: activities to demonstrate how the scenarios can be used to help policy development • Post-workshop: use the system maps (CLD) to understand how the system works and compare to the reference data collected by the organization – CLD validation <p>“Scenario planning was used to explore the organization’s entire environment system and understand how it might evolve”</p> <p>“SD however, despite being capable of exploring such broad system applications, was applied to a very specific problem with limited system scale”</p>	<p>SD approach did address issues that remained unanswered by the scenario planning;</p> <p>This particular study it may not have reaped the full benefit from integrating these methods since SD was just used to address a specific problem</p>

Study title	Authors	Local	Research objective	Methods description	Outcomes
<i>Using Scenario Visioning and Participatory System Dynamics Modelling to Investigate the Future: Lessons from Minnesota 2050</i>	Olabisi, Kapuscinski, Johnson, Reich, Stenquist and Draeger (2010)	USA (Minnesota)	<p>The three purposes of this exercise are:</p> <ul style="list-style-type: none"> • assist regional leaders in making strategic decisions that would make their communities sustainable; • to identify research gaps that could impede the ability of regional and state groups to plan for the future; • to introduce more systems thinking into planning and policy-making around environmental issues. 	<p>Combining participatory SD modelling with scenario visioning: participatory SD modelling was used to examine selected scenarios for their consistency or inconsistency with current data trends, and to compare scenarios using quantitative measures. In turn, scenarios allowed researchers and community partners to explore surprising and “game-changing” events that can arise exogenously to the Minnesota system and could not have been modelled:</p> <ul style="list-style-type: none"> • Regional scenario visioning workshop: scenarios and backcasting method to build an action plan • Follow-up surveys • Building CLDs: organizers constructed a CLD depicting scenario-specific relations between variables as envisioned by the participants • Statewide workshop: scenarios + modelling 	<p>Scenarios and modelling complemented one another, and that both techniques allowed regional groups to focus on the sustainability of fundamental support systems (energy, food, and water supply). The process introduced some creative tensions between imaginative scenario visioning and quantitative SD modelling, and between creating desired futures (a strong cultural norm) and inhabiting the future (a premise of the Minnesota 2050 exercise)</p>
<i>Mapping Maritime Sustainability Issues with Stakeholder Groups</i>	Videira, Lopes, Antunes, Santos and Casanova (2012)	Portugal	<p>Exploration of the use of qualitative system dynamics tools and participatory modelling approach to support scoping stages of an integrated sustainability assessment (ISA) process; Exploration of the potential of CLD as tools for mapping maritime sustainability issues with stakeholder groups at the initial ‘scoping and abstraction’ stages of an ISA process</p>	<p>The methodology follows these steps:</p> <ol style="list-style-type: none"> 1. Scoping & abstraction: mapping and sharing understanding of current sustainability issues and policy responses through interviews, CLD and participatory modelling workshop. 2. Envisioning & goal setting: develop shared future vision and corresponding objectives and sustainability criteria through visioning workshop and indicators 3. Model formulation: collaborative development of simulation model through participatory modelling workshops and interviews with stakeholders <p>Simulation and assessment: analysis of alternative scenarios and assessment of policies through participatory modelling workshops and interviews with stakeholders</p>	<p>The process generated positive outcomes at individual and group levels, stimulating basic system thinking knowledge and skills:</p> <ul style="list-style-type: none"> • Involved a representative group of stakeholders; • ST tools helped to structure discussions and analyse problems; • Creation of a common language • More integrated view of maritime issues; <p>CLD is a useful tool for problem conceptualization</p>

3. Methodology

In the methodology section, the methods and instruments used for this study will be explained – how the workshops from 2015 and 2016 were designed and how the data were collected, analysed and processed.

3.1. Data collection and analysis methods

The methodology of this document provides the tools to answer the research questions. Moreover, the combination of the following tools will honour the title of the thesis – combining scenario workshops with participatory SD modelling. The following scheme (Figure 3.1) represents the stages of this thesis and their outlines.

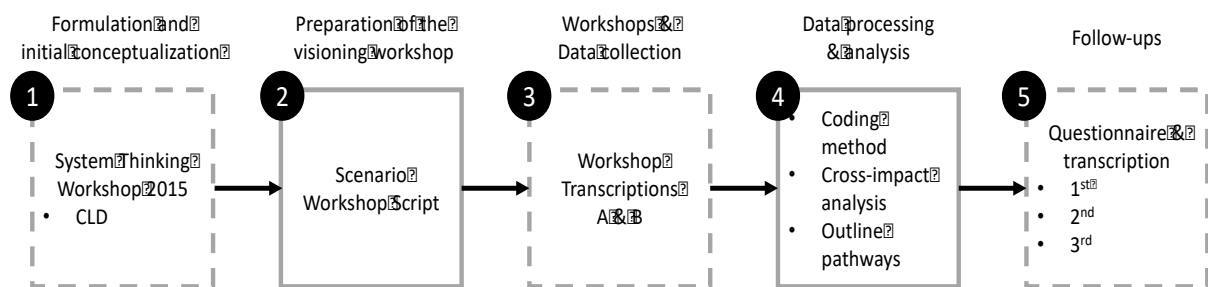


Figure 3.1 Overview of research process and deliberative and analytical steps

The scheme presents dotted lines and continuous lines. The first set represents the stages of the process in which the author of the thesis did not intervene, on the other hand, the continuous lines symbolizes the stages where the author contributed directly, such as the preparation of the scenario workshop and the data processing and analysis. The following figure is a visual representation of the workshops and their expected outcomes, that will be further explained in this chapter.

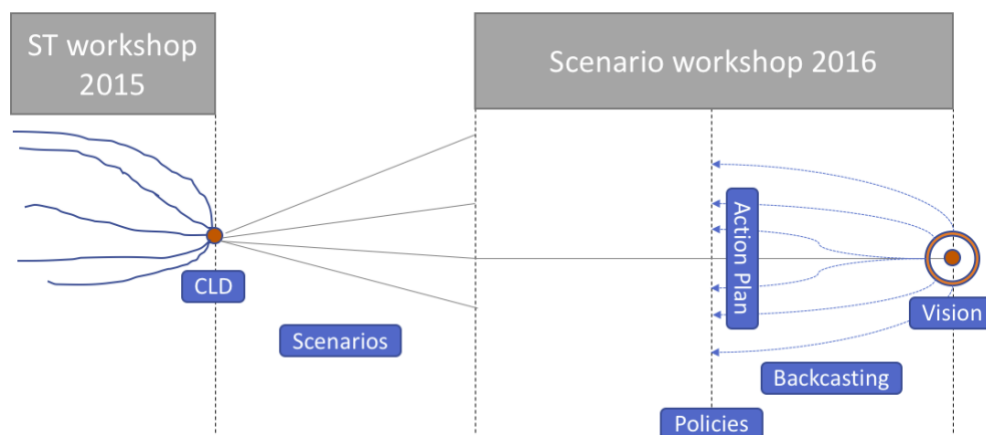


Figure 3.2 Overview of the workshops 1 and 2 and their outcomes

3.1.1. System Thinking workshop 2015 (Hager et al., 2015)

The first workshop conducted by Hager, Kopainsky, & Nyanga (2015) aimed to study the knowledge change within smallholder farmers in Zambia as an outcome of system thinking (ST) group interventions and qualitative system modelling. Moreover, all the participants who held the workshops A and B, in 2016, were also in the first one. The research questions and the analytical framework are presented in Figure 3.3.

System models are described as “conceptual artefacts and interpretative maps of understanding inductively derived from interview data” and “transitional or boundary objects (...) jointly created during a system thinking intervention offering specific affordances to the learners” (Hager et al., 2015). While conceptual change is “broadly understood as a process of learning and knowledge development” (Hager et al., 2015).

This case study uses a mixed-method approach due to the qualitative nature of the research questions, the reduced sample and the quite natural context of the analysis. The knowledge analysis has the purpose to recognize, trace and investigate the integration of knowledge in categories, apprehended by the stakeholders during the workshop. Moreover, two dimensions of interaction were taken into consideration: group interaction and the interaction of the participants with the model (model interaction) (Hager et al., 2015).

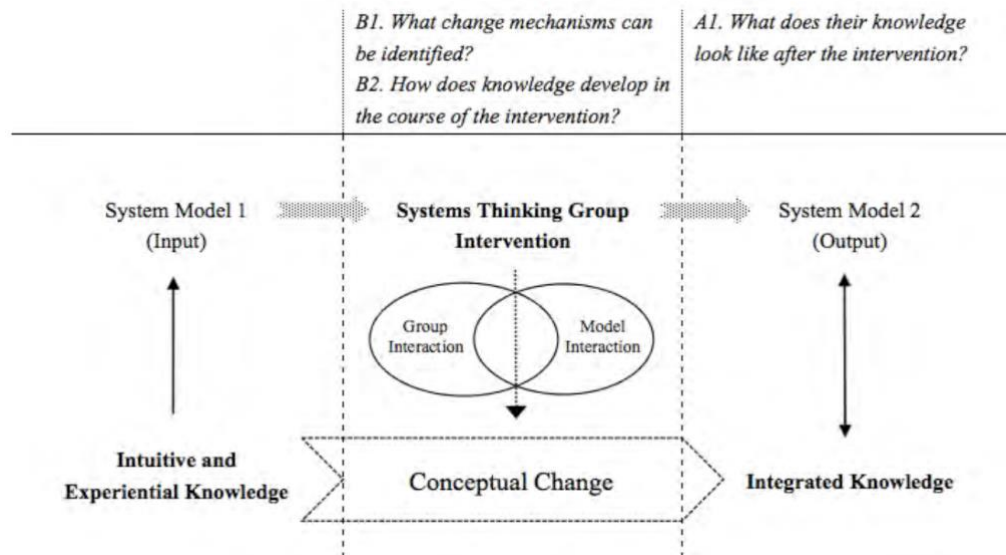


Figure 3.3 Research questions and analytical framework of conceptual knowledge change in the course of a systems thinking group intervention using qualitative system models (Source: Hager et al., 2015)

The workshop process was designed in six steps: pre-workshop considerations, phase one, phase two, phase three, phase four and post-workshop interviews. The first step was before the workshop was held, i.e. the preparation for the workshop, starting with a basic casual loop diagram of food security created in a previous activity (Figure 3.4).

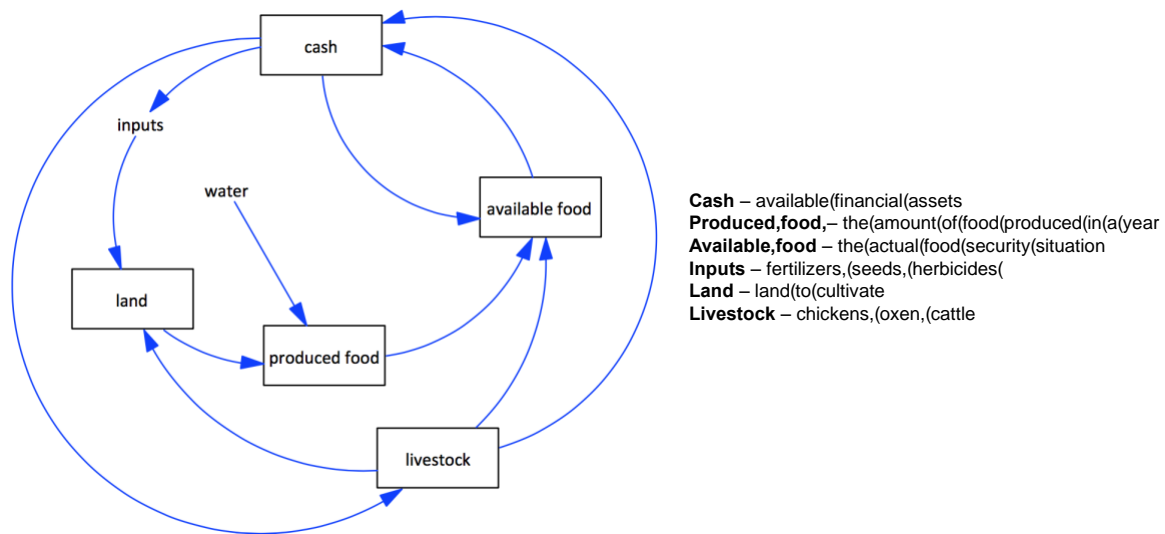


Figure 3.4 CLD as a workshop starting point (Source: Hager et al., 2015)

The group was divided into two groups and it lasted 2,5-3,5 hours each. The next table shows the activities of the workshop in each phase.

Table 3.1 System Thinking workshop 2015 phases (Adapted from Hager et al., 2015)

Workshop phase	Activities
1	Discuss the variables of the CLD starting point, using pictures and objects to represent them (Figure 3.4)
2	Link the variables until the two main feedback loops were complete
3	Use glasses of water to illustrate the dynamic of the feedback loops on the variables. The glasses were filled up with water to represent the desirable quantity of each stock variable.
4	Discuss the process of filling up and draining down the glasses – identify the processes that increase or reduce the stocks, respectively
Post-workshop interviews	<p>One week after the workshops a questionnaire was made with the following topics:</p> <ul style="list-style-type: none"> - structural components of the system of interest - policy options to avoid unfavourable stock levels as well as dynamic implications - the use of objects, pictures and visual diagram properties - potentially unsolved disagreements throughout the workshops discussion - unexpected moments during the workshop - new insights and lessons Learned - the participant's feedback of the workshop when it is compared to more traditional participatory methods

The data collection was made by video and audio. Subsequently, the information was translated and written from Tonga to English into transcripts. Finally, the data analysis method was held in two parts: analysing mediated conversational action, to answer the questions B1 and B2, through the Conversational Argument Coding Scheme (CACS) by Canary and Seibold (2010), which allows for a close look into verbal communicative interaction between participants; and analysing conceptual change towards shared system understanding, which answer the research questions A1 and also B2 (see Figure 3.3).

3.1.2. Preparation of the Scenario Workshop

The Scenario Workshop was created in order to continue the line of studies of the previous workshop explained above, and the CLD resulted from it is used as a base/starting point (see Figure 4.4) during this second study. According to Kallis et al. (2009) the methodology of a Scenario Workshop follows the next steps:

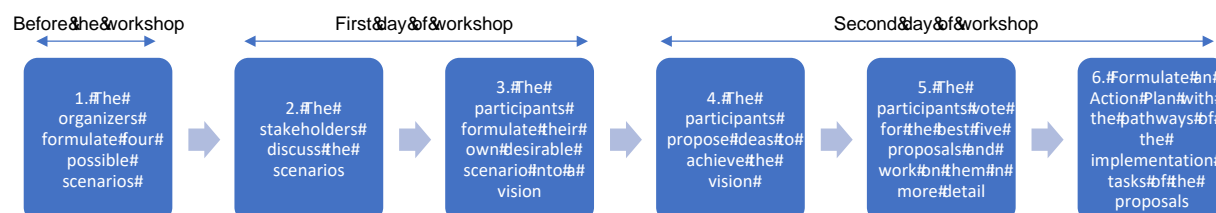


Figure 3.5 Scenario Workshop methodology steps (Adapted from Kallis et al., 2009)

This methodology normally lasts two days and includes stakeholders who represent larger constituencies – policy-makers, business representatives, scientists and citizens; involving them in assembly debates, activities, presentations, organized by specialised facilitators. The organizers structure the objectives and also select the stakeholders (Kallis et al., 2009).

In this case, the process of the preparation of the workshop has other methodology steps, since the time was limited – each workshop last approximately four hours – and the group was already chosen due to the previous workshop but held this second workshop in an aleatory way – one of the organizers was driving a car and collecting the participants. The main objective of this workshop was to educate the community regarding food security. The next scheme shows the Scenario Workshop steps adapted to the conditions and limitations of the study:

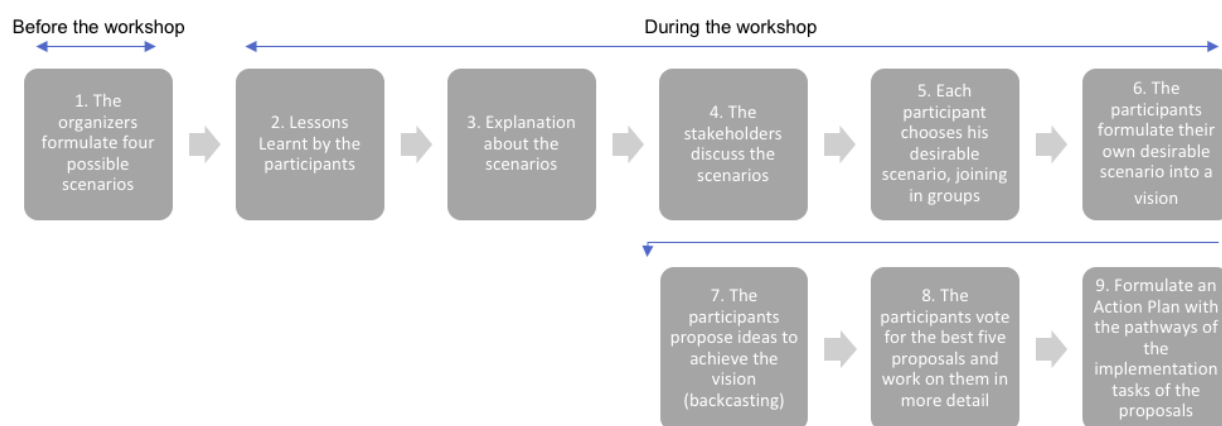


Figure 3.6 Scenario visioning Workshop steps of the case study

The first step is similar to the original methodology and the scenarios were prepared based on the goals of this case study. The axes were related to dimensions which have mainly concern, the climate change (X-axis) and government (Y-axis): if the climate change would have a slow or high pace and if the

government would be proactive or reactive to these events with regard to the specific issues of food security and agriculture. Moreover, the scenarios were explorative and qualitative, where their storylines were written according to the reality of the country. Contrary to the original methodology, the participants were all representing the same sector, which is smallholder farmers.

The next steps were supposed to be done during the workshop, and some were added to the original methodology (Figure 3.5), such as the Lessons Learned by the participants, which is a recap of the previous workshop map/CLD and to introduce more variables and relations between them; and the possibility of each participant to choose his/her desirable scenario. In the sixth stage, the participants could add, remove or replace elements from the scenarios; then, in the seventh step, the participants should answer the question “What should I do in the present to achieve that vision?” and respect the normative backcasting method. Lastly, the final step aims to build an Action Plan and also to find unintended consequences from each proposal in the pathways. The original script formulated by the author of this dissertation is presented in Appendix 1.

3.1.3. Workshops and data collection

The initial sources of the research are in video, audio and photography formats. After capturing in these formats, the data was translated from Tonga to English and written down in form of dialogues, identifying each one of the stakeholders and interviewers – transcriptions (Appendices 2 and 3).

3.1.4. Follow-up

The main purpose of the Follow-up interviews/questionnaires is to trail how each participant was acting after the Scenario Workshop. The follow-ups were conducted in Tonga, through an audio-visual material, and translated into English, similarly to the workshops.

After the Scenario Workshop, three follow-ups were held, in May (1st), June (2nd) and October (3rd) 2016; the last one has the transcription in Appendix 4. The main subjects were *Livestock*, *Cash*, *Food Security* and *Land*; and the spaces to complement/answer were the action taken for each of the subjects, the reasons of taking or not taking the actions, and the next plans (what happens next/way forward). Table 3.2 represents a sample of the full table (Appendix 5), which includes all the participants who collaborated in the follow-up activities and per workshop group (A or B).

Table 3.2 Follow-up table

Participant		Follow-up	Action taken	Reasons	What happens next/way forward
P01 (A)	Livestock	1 st	<ul style="list-style-type: none"> Bought some livestock Bought salt (medicine) 	<ul style="list-style-type: none"> Lost many livestock in the previous year Salt is used for deworming (disease prevention) 	<ul style="list-style-type: none"> Buy cows and chickens
		2 nd	<ul style="list-style-type: none"> Bought salt (medicine) 	<ul style="list-style-type: none"> Salt is used for deworming 	<ul style="list-style-type: none"> Sell goats in order to buy iron sheets (for the roof of the house) – livestock business
		3 rd	-	-	-
	Cash	1 st	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Busy harvesting 	<ul style="list-style-type: none"> Keep cash in the asset form
		2 nd	<ul style="list-style-type: none"> Joined OSAWA (lending group) 	<ul style="list-style-type: none"> Get a loan 	<ul style="list-style-type: none"> To buy iron sheets (for the house)
		3 rd	-	-	-
	Food Security	1 st	<ul style="list-style-type: none"> Avoided Carelessness 	<ul style="list-style-type: none"> To sell food when the price rises 	<ul style="list-style-type: none"> Reserve a big amount of food so after she can hire labour (piecework) and reserve some for household consumption
		2 nd	<ul style="list-style-type: none"> Reserved more maize 	<ul style="list-style-type: none"> To sell food when the price rises 	<ul style="list-style-type: none"> Sell maize
		3 rd	-	-	-
	Land	1 st	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Still harvesting 	<ul style="list-style-type: none"> Cut down trees on a dormant land in order to burn them, so the ashes can be used to improve the soil fertility
		2 nd	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> No manure 	<ul style="list-style-type: none"> Practice crop rotation
		3 rd	-	-	-

3.2. Data processing and analysis

3.2.1. Coding Method

The coding method is used to process and systemize qualitative data. In this case, the qualitative information comes from the scenario workshop, in form of transcriptions of its conversations. Even though this method was not made especially for SD modelling, it can support the qualitative data for building CLDs and models, being especially important when the text data are neither collected by the modeller nor intended to be used for the SD modelling purpose. The method developed in this study employs a grounded theory approach, to identify problems, key variables, and their structural relationships from purposive text data (Kim & Andersen, 2012). Grounded Theory (GT) is a research methodology, developed in the context of social research and inspired by the interpretative paradigm, which aims to generate theory through the analysis of data and explore it (Faggiolani, 2011). Table 3.3 describes the coding process.

Table 3.3 Summary of coding process (Source: Kim & Andersen, 2012)

Description of the process	Main tool	Input	Output
1. Discovering themes in the data	Open coding	Raw text data (Appendix 2. Workshop transcription A and Appendix 3. Workshop transcription B)	Definition of problem and system boundary; selection of relevant data segments
2. Identifying variables and their causal relationships	Open coding; casual links	Data segments (each Segment = one argument + supporting rationales)	Coding charts (Appendix 6. Coding Charts workshop A and Appendix 7. Coding Charts workshop B)
3. Transforming text into words-and-arrows diagrams	Causal links; causal maps	Coding charts	Simple words-and-arrows diagrams (Appendix 8. Words-and-arrows Lessons Learn and Appendix 9. Words-and-arrows Policy proposals)
4. Generalizing structural representations	Axial coding; causal maps	Simple words-and-arrow diagrams	Final causal map (Figure 4.17 and Figure 4.29)
5. Linking maps to the data source	Map/data ID numbers	Coding charts and final causal map	Data source reference table

Before starting the coding process, the transcriptions were translated to English and the name of the participants changed to codes, thus the number of the line of each speech, which is called Conversation Identification Number (CIN). Otherwise, all the text content maintained its original form.

The first step is to discover the themes in the data, using the open coding and the raw data, which in this circumstance are the Transcripts A and B. In this case, the problem was already defined, which was finding policy proposals to avoid or to defeat a future scenario with poor rainfall and reduced help from the government; while the selection of relevant data segments was made during the reading and analysis of the transcriptions, regarding the research goals.

The process of identifying variables and their causal relationships resulted in the coding charts, that are shown in Appendices 6 and 7. According to Kim and Andersen (2012), “using a coding chart the data are broken down into small segments that contain one argument about the system state and rationales supporting the argument”. Each concept is represented by a connection between variables, X and Y, for example, and the nature of their relationship polarity – if it is positive, when X increases Y and reinforce the system, or if it is negative, when X increases, decreases Y, balancing the system (Kim & Andersen, 2012). In this part of the process, the coding charts are filled-up with the information about the main argument, the reference from that segment (speaker code, CIN and page), the causal structures (causal variable, effect variable and relationship type), the information source, i.e. in which section of the transcript it was, and a note, if necessary. The following table (Table 3.4) is an adaptation from Kim and Andersen (2012) coding chart.

Table 3.4 Coding Chart example (Adapted from Kim & Andersen, 2012)

Main argument:		How to increase/decrease cash?				
Casual structure:	Cause variable:	Food Surplus	Livestock	Piecework	Avoiding Carelessness	Trees
	Effect variable:	Cash	Sales "Business"	Cash	Cash	Cash
	Relationship type:	Positive	Positive	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P09 – 78 p.104/105	P06 – 105 p.106	P10 – 173 p.109	E01 – 211 p.111/112	P01 – 342 p.115
Notes:		"(...) selling that food, yes you can sell some and leave some for food (...)"	"(...) sell the old livestock in order to buy small ones"	N/A	Not buying anyhow	"I went in the bush to cut trees, burnt charcoal and I got cash"
Information source:		Comments heard from the revision of the previous workshop (2015)				Comments heard from the feedback from participants

Later, the process of breaking down the data into more general pieces continues, when the text is transformed into words-and-arrows diagrams. The data is transformed into more general and common variables to simplify the final map, for example, fertilizer, manure and seeds are named as inputs. In this step, normally the stocks and flows are identified, however, in this study, this distinction was not made because was not relevant to the case. The following table is a representation of the words-and-arrows diagrams of causal arguments, all this can be found in Appendices 8 and 9.

Table 3.5 Words-and-arrows diagrams of causal arguments example (Adapted from Kim & Andersen, 2012)

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Food Surplus	Cash	+	Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A	10
Livestock	Sales "Business"	+	Livestock $\xrightarrow{+}$ Sales "Business"	A	11
Piecework	Cash	+	Piecework $\xrightarrow{+}$ Cash	A/B	12
Avoiding Carelessness	Cash	+	Avoiding Carelessness $\xrightarrow{+}$ Cash	A	13
Trees (short term)	Cash	+	Trees $\xrightarrow{+}$ Charcoal $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A/B	14

Table 3.5 was adapted from Kim and Andersen (2012) and has the cause, effect and polarity from Table 3.4. Additionally, the A or/and B letters indicate which transcription, A or/and B, each argument comes from, and the MIN is the Map Identification Number, so it will be possible to know the origin of the arguments later in the map.

The fourth step is to generalize the structural representations, i.e. transforming the arguments of the previous table in diagrams. In this specific case, the causal maps were built through the coding process, and they can be consulted in the Results and Discussion chapter.

The last step of this coding process is to link all the diagrams into a final SD model. In this case, all the diagrams were connected into two final CLDs (see Figure 4.17 and Figure 4.29). In this later phase, some information could be lost, that is the reason why is important to keep the CIN and MIN numbers to use as references (Kim & Andersen, 2012). Additionally, the last two steps required *Vensim* tool to structure the maps. Lastly, all this procedure and results can be found in the Results and Discussion division.

3.2.2. CLD analysis – Leverage Points by Meadows

In order to analyse the feedback loops originated from the workshops, the methodology of Meadows (1999) was used. Leverage Points (LP) are “points of power”, i.e. “places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything” (Meadows, 1999). The LP can be identified in the system when it has the power to transcend paradigms, or it influences the mindset of the system (goals, structure, rules, delays), feedback loop control intervention (positive or negative), or even physical elements from the system, for instance, constants, parameters, delays, among others (Meadows, 1999), as it is shown in the next figure. Additionally, the inverted pyramid characterizes the LP from the large effect on the system behaviour to the small problem solving, where the power of transcending paradigms is the highest LP. LP was determined for the Lessons Learned activity conducted at the beginning of the scenario workshop.



Figure 3.7 Places to intervene in a System (Adapted from Meadows 1999)

3.2.3. Cross-impact analysis

This method is similar and based on the document *Improving understanding on degrowth pathways: An exploratory study using collaborative causal models* from Videira et al. (2014). According to the authors, this tool was an adaptation of cross-impact analysis family of methods. This method aims to

evaluate the impact and sensibility of each segment on each other, in a systematic way, showing how critical the segments can be to the system (Videira et al., 2014).

The cross-impact matrix was used, in this thesis, to evaluate the mutual sensitivity between the policy proposals proposed by the workshops participants. The next table represents this method of analysis.

Table 3.6 Cross-impact matrix method example (Adapted from Videira et al., 2014)

Proposal effect:		from	on	A	B	C	AS	%
Policy proposal A	A				1	1	2	100
Policy proposal B	B	0		0		0	0	0
Policy proposal C	C	0	1				0	50
	PS	0	2	0				
	%	0	100	0				

Value 0 is given when there is no direct effect from the proposal A on C, for example. While, value 1, indicates that a proposal has an influence on the other, such as A on B. Moreover, AS means “Active Sum”, representing the sum of all the values from the same row, and indicates how strongly that proposal effects on or leads the system. Last but not least, PS spells “Passive Sum”, which is how intensely the proposal is influenced by the others and is the sum of the columns values. After all, the percentages are estimated by dividing each sum of a row and column by the major AS and PS, respectively (Videira et al., 2014).

Then, the diagram of the cross-impact is designed, with two axes – the AS (X-axis) and PS (Y-axis) – and their matching points for each policy proposal. This diagram has four quadrants – critical, reactive, buffering and active. Each of these adjectives is explained in detail in the Results and Discussion chapter when analysing Figure 4.30.

3.2.4. Outline policy proposals pathways

At last, an outline table of the policies is made with the insights from all the methodology process. This table represents the pathways in stages – entry points (1), short-term (2), medium-term (3) and long-term (4) – and also unintended consequences from every policy, risks, uncertainties, among others, related during the workshops; in addition, the outline table was based on the Videira et al. (2014). The table (Table 4.5) of this case is shown in the Results and Discussion section.

3.2.5. Action Plan Outline

The action plan is a consequence and the last step of the scenario workshop method, which was explained above. The action plan aims to guide each proposal pathways, in order to achieve the target objective. In this study, the action plan is the result of all the tools used before, and has an innovative design – the segments from the CLD in a vertical form (Figure 4.31)

4. Results and Discussion

In this chapter, the results of the workshops from 2015 and 2016 are presented and discussed, as well as the case study area and participants. The workshop from 2015 refers to the System Thinking workshop which was the base for the case study of the present document. So, related to the Scenario workshops A and B, from April 2016, resulted in the following key outputs: Transcriptions A and B, which are in Appendices 2 and 3, respectively, and have all the dialogue between the interviewers and participants; Coding Charts A and B, with the topics relevant to the present study (Appendix 6 and Appendix 7); Words-and-arrows from the Lessons Learned (Appendix 8) and from the Policy Proposals of the workshop (Appendix 9), they represent the variables and their links in a horizontal form; CLDs, that were built from the previous results, one from the Lessons Learned, and others that contain each Policy Proposal founded in the workshop to overcome the scenario “no rain, no government help”; Cross-Impact Matrix (Table 4.4) from the Policy Proposals and its Diagram (Figure 4.30); Table with the Outline of the Policy Proposals’ pathways (Table 4.5); Action Plan Outline (Figure 4.31) with the pathways for each proposal; and, finally, a Follow-up transcription from some participants (Appendix 4), where the complete table with all the information related to what each person has done after the workshops from April 2016, is presented in Appendix 5.

4.1. Case study

Zambia, also known as the Republic of Zambia, is a landlocked country located in the Southern Africa, and it borders on eight other countries – the Democratic Republic of the Congo, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia and, finally, Angola (Figure 4.1), covering 752 612 square kilometres. The capital lies in the south-central and it is called Lusaka. This case study is based on two villages of the Chibombo district, Mpikwa and Chitumbo (Figure 4.2), found around 73 km up north from the capital. These villages have a distance of six kilometres from each other.

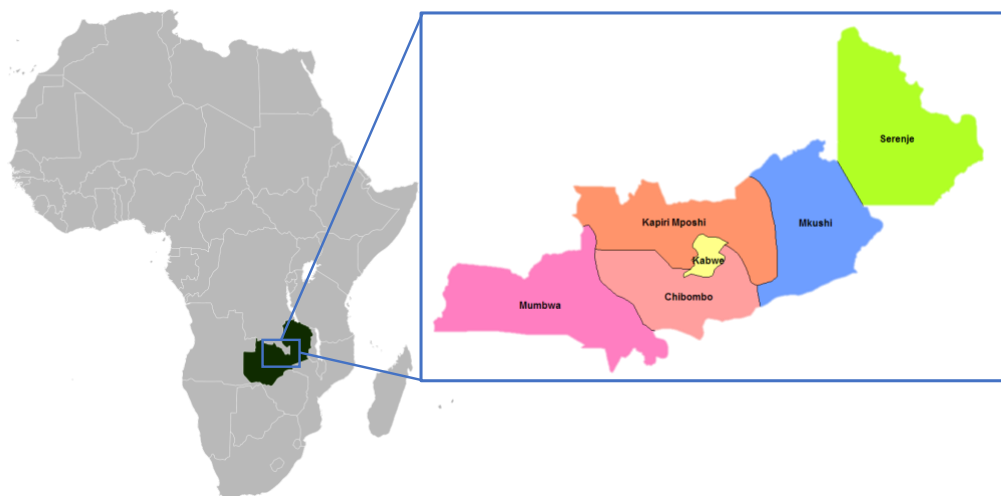


Figure 4.1 Chibombo District in Central Province, Zambia, Africa (Adapted from Wikimedia, n.d.)

According to the World Bank in 2016, Zambia has a population of 16,6 million habitants, where 58,2% practice farming activities, wherein this percentage, 51,2% are on a small scale; having an average population density of 22,1 persons per square kilometre in the whole country, while Lusaka Province has 126,8 persons per square kilometre, which is the highest in the country (CSO, 2015). According to the World Food Programme (WFO), Zambia was classified as 139th out of 188 countries on the Human Development Index (HDI)² in 2015 (Cammelbeeck, 2015).



Figure 4.2 Chitumbo Village (Source: Kopainsky, 2016)

In 2015, 40,8% of the population were living in extreme poverty (1,25\$/day PPP), where 76,6% of the population who habits the rural areas are considered poor, while the urban population was 23,4% (Lusaka Times, 2016). Relatively to the adult literacy level, the percentage is 61,4% (data from 2008-2012) and the average schooling years is 5,5 (data from 2000), as reported by Unicef.

Politically, since 1991, the country has a multi-party democratic governance and is divided into ten provinces. The country got the independence from Britain in 1964, that is the reason the official language is English, among others, including Tonga (CSO, 2015).

This country had an annual urban population growth rate of 4,18% in 2015, more than the double of the World – 2,05% (The World Bank, 2016). Since the year of 2002, this rate has been increasing, what means that there are more people living in this country compared to the previous year, so in order to achieve food security is mandatory to increase the food produced in the country.

² “The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimension.” (United Nations Development Reports, 2015)

However, the agriculture has an impasse hence the deficit of inputs, transports, markets and land fertility (Saldarriaga et al., 2013), even though 58% of the land area is potentially good for agricultural production (CSO, 2015). Commonly, farmers are mainly smallholders who cannot have access to inputs, in consequence of the high price and demand. In the meantime, the agricultural procedures and techniques are not the most appropriated ones, leading to a decrease in soil fertility and consequently the production (Hager et al., 2015). Figure 4.3 represents the map of the agro-ecological zones in the country.

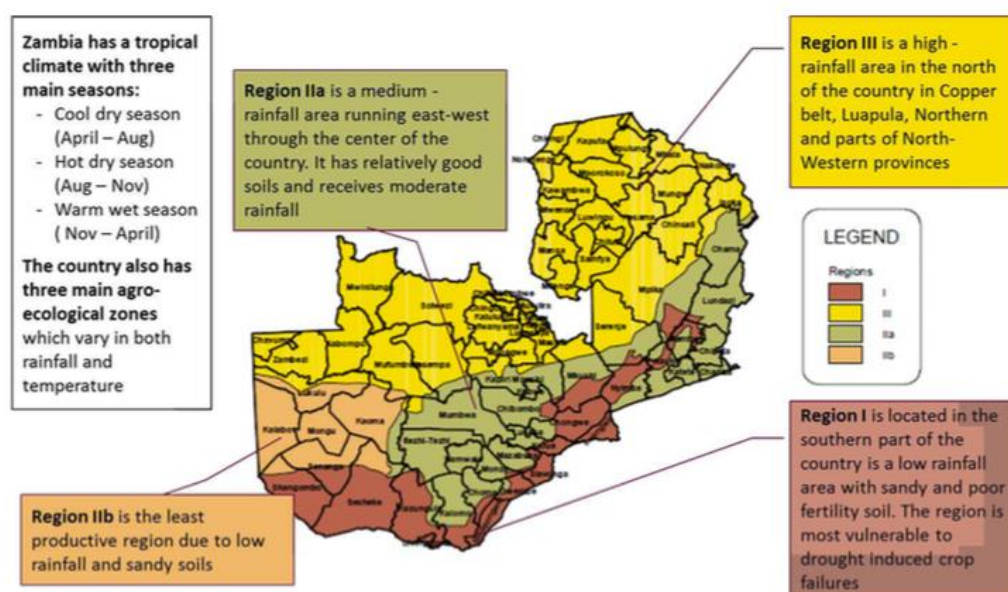


Figure 4.3 Map of agro-ecological zones in Zambia (Source: Mercy Corps AgriFin Accelerate, 2017)

The economy of this country was based on the copper mining industry, but in the 1970s the international prices decreased, leading to an economic crisis (Saldarriaga et al., 2013). Actually, the main objective is to diversify the economy from mining to agriculture, in consonance with the Revised Sixth National Development Plan (R-SNDP) in order to reduce poverty, creation of employment opportunities, and increase food security; further, the agricultural sector in Zambia contributed with 13% of the GDP in 2012 (Zambia Invest, n.d.). Besides, the others two main sectors of this country are manufacturing and tourism.

Rearing livestock is another source of income and to ensure food security, in 2015 in Zambia, 34,4% of the population owned livestock, largely cattle (55,1%), followed by goats (54,6%), pigs (30,9%) and sheep (1,6%). Charcoal production and business, hunting, fishing, and other kinds of resource exploitation are also common in order to increase revenue (CSO, 2015)

Smallholder farmers have the biggest percentage of the agricultural activities – 76% – having from five to ten hectares and cultivating from three to five food and stable crops, mostly. Food crops such as maize (51% of total production by dollar value in 2012), cassava (18%), vegetables (9%), soya beans (7%), groundnuts (5%), wheat (5%) and fruit (4%); and cash crops specifically cotton (44%), sugar cane

(32%) and tobacco (24%) are principal crops in Zambia (Mercy Corps AgriFin Accelerate, 2017). The food crops are mainly for their own consumption, while the cash crops are to generate income.

Furthermore, Zambia is one of the countries of Sub-Saharan Africa which faces challenges related to food security, despite other issues such as undernutrition, chronic poverty, natural disasters and social problems (World Food Programme, 2016), being one of the ten most food insecure countries in the world (Saldarriaga et al., 2013). The main reasons for the lack of food security are the annual urban population growth, the weather oscillations (rainfall patterns, temperature), poor agricultural technologies and techniques, and low educational and health levels.

Zambia is extremely susceptible to drought, because of its geography and since the agriculture is 90% rain-fed (Mapfumo et al., 2013), the climate change can affect the country in a negative way. The last 20 years the rainfall patterns are changing, on the word of FAO, Zambia's maize production decreased by 12% in 2012/2013 owing to oscillations of weather and a worm infestation. These climatic shocks lead to dramatic consequences, for instance, poverty, keeping malnutrition and limit their possibilities to overcome (World Food Programme, 2016). There are some possible techniques which can help to surpass, for example, crop diversification or planting varieties maturing late, but the price of the seed is much superior to the conventional ones (Hager et al., 2015). Curiously, farmers in this country have procedures to identify if the planting season, which is from October to November, will be good or not, through the analysis of the fruity forest trees and winds; farmers also believe that if the wild trees bear more fruit it indicates hunger (Saldarriaga et al., 2013).

To raise and motivate the agriculture sector, there are some programs and activities from the Zambia's government, such as Food Reserve Agency (FRA) and Farmer Input Support Programme (FISP), and also from international organizations, like the United Nations Development Assistance Framework (UNDAF), which aims to develop food security. FRA and FISP are the two principal programs from the government and invest 84% in agriculture causes: providing mainly inputs (fertilizer, seeds, for example) through an Electronic Voucher (United Nations Development Reports, 2016).

4.2. Preliminary Models – System Thinking workshop in 2015

The results from the System Thinking workshop in 2015 resulted in a complex causal map, as it is shown in Figure 4.4. This CLD was the result of activities in the workshop which elaborated on the initial CLD presented before in Figure 3.4.

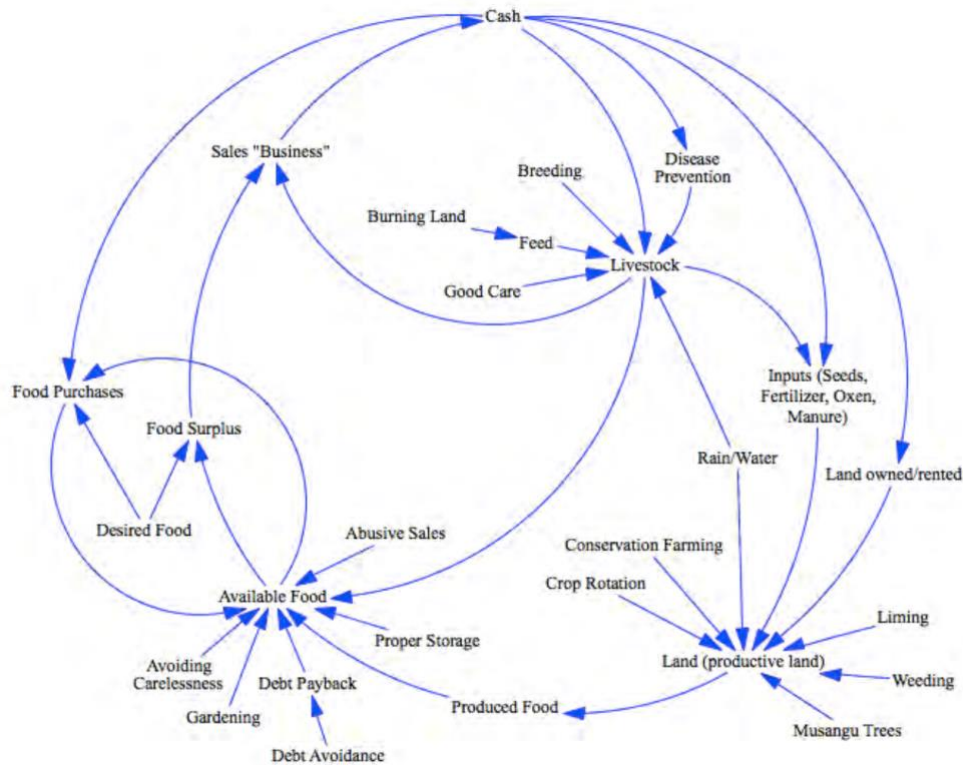


Figure 4.4 Map of participant's causal chain descriptions shared in three interviews following workshop 2015
(Source: Hager et al., 2015)

The System Thinking workshop also proved that it is possible to integrate local-based knowledge with science-based systemic knowledge, using this approach through model building. The participants also showed they developed an intermediate level of system understanding and reasoning, overlapping knowledge from farming, food and system thinking domains. The figure above, partially answers the A1 question (“*What does farmer’s knowledge look after facilitated system thinking group intervention?*”) (See Figure 3.3). Furthermore, the other research questions, B1 and B2, were answered due to the use of tangible objects, which made the participants increase their notion of causality between the variables and because of the water glass analogy, that made the stakeholders learn about the behaviour of the feedback loops.

4.3. Scenario workshops

4.3.1. Participants

The participants who took part in the Scenario Workshop were mainly smallholder farmers. The smallholding is a small and family-focused farm, whose areas are from less than one hectare to ten hectares. Usually, those farmers work in a family environment and part of the amount produced is designated for their own consumption. In 2012, 80% of the farmland were managed by this kind of farmer in Sub-Saharan Africa and Asia (Food and Agricultural Organization, 2012).

The workshop had two group of participants, A and B, from the Chibombo district, situated in the Central Province of the country, who were mainly from two villages: Mpikwa and Chitumbo. The workshop groups were randomly formed, thus one of the organizers was driving around the villages and picking up the members. Table 4.1, further in this chapter, holds all the information of the participants, such as their code, gender, village they come from, age, marital status, household size, tillage used (conservation farming and/or conventional farming), level of education, total number of livestock (goat, chicken, cattle, guinea fowls, among others), maximum number of bags with maize (50 kg) sold in a year, number of months they could produce their own food, if they participated in the previous workshop, and, finally, their income classification. Additionally, the names of the participants were not mentioned and switched for codes (P01, for example), in order to protect and maintain their anonymous identity; moreover, the participants did not receive any monetary reward for taking part of this study.

In workshop A, 13 participants were mainly from Mpikwa Village except one that came from Chitumbo Village (P04); on the other hand, the workshop B participants were all from Mpikwa and they were 12; making a total of 25 participants. The next figure represents the number of female and male participants in both of workshops, A and B.

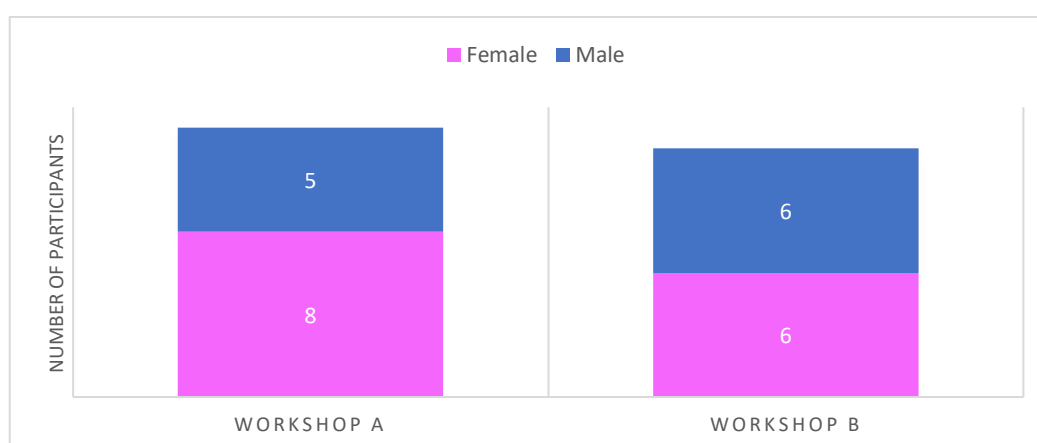


Figure 4.5 Participants by gender – A and B workshops

Relatively to the participants' age, the average of the workshop A is 51, while workshop B is 38. The oldest participant of all the research was 70 years old, from the A group, and the youngest 27, from the B group (Table 4.1). The next figure shows that the intervals between ages, where the 46-55 interval is the one that has more participants in workshop A, whereas for workshop B is the 36-45 interval. Eight participants in total did not provide this information.

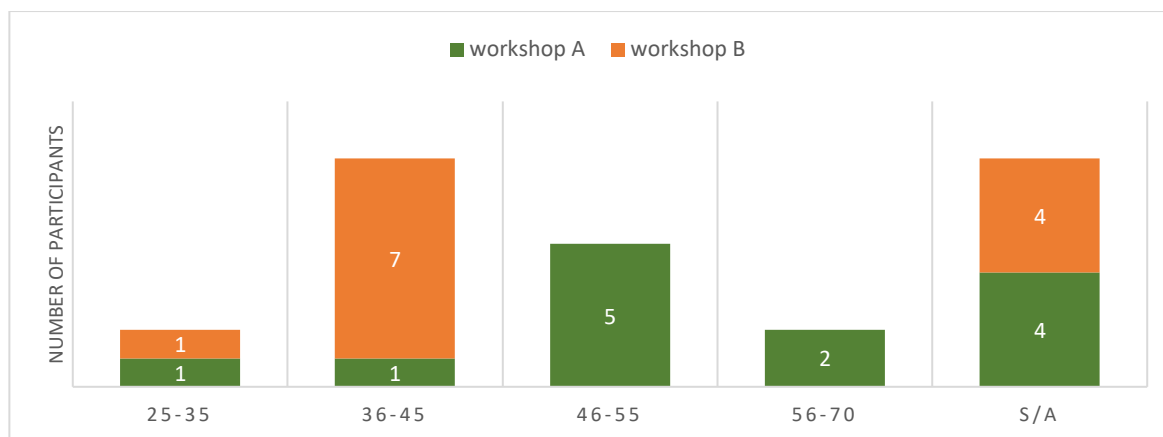


Figure 4.6 Participants by age – A and B workshops

The marital status of the participants is shown in the next figure. The most part of the stakeholders are married, six people are divorced, one is single and two widowed, while seven did not give this information

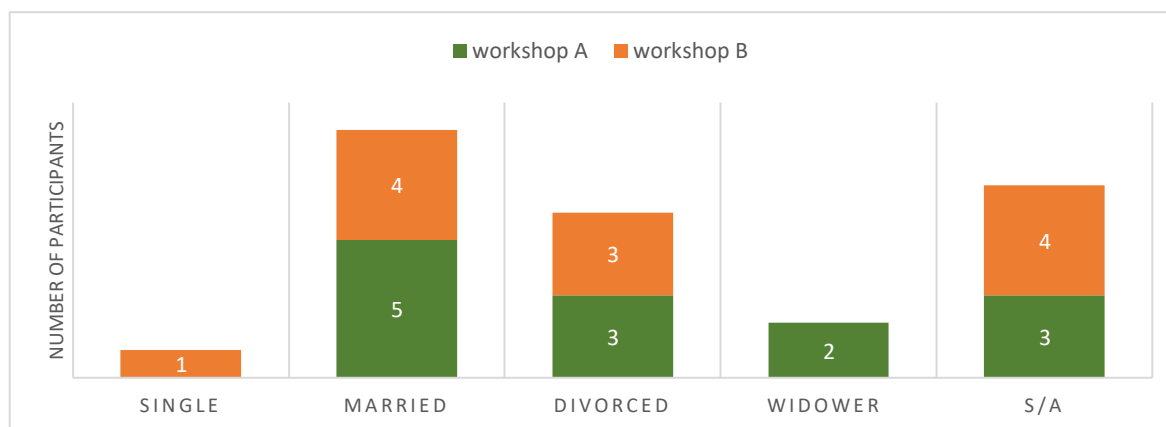


Figure 4.7 Participants by marital status – A and B workshops

The household farm has an average of 6,8 ha in workshop A and 7,6 ha in workshop B. Relatively to the tillage used, eight people from the workshop A use conservation farming and nine conventional farming; when it comes to the workshop B, six participants use conservation farming and the same number for conventional farming. In this case, participants could use the two types of tillage.

Figure 4.8 below represents the participants by level of education. There is just one person with no studies, who participated in the workshop A; seven people in total with middle basic level, from grade 5 to 7, and this is where the most part of workshop B participated are included; the upper basic level relates from the grade 8 to 9, and the most part of the group A is at this level; two and three participants from A and B, respectively, have the highest school level of education (from grade 10 to 12); and, just one has a college degree. Lastly, four people in total did not give this data.



Figure 4.8 Participants by level of education – A and B workshops

The livestock number contains all the possible types of animals that a participant has – cattle, sheep, goats, pigs, chicken, donkey, guinea fowls, turkeys, ducks, doves. This number can be consulted individually in Table 4.1. However, the average for workshop A is 55 and for workshop B is 27 per participant.

Other relevant participant data is the maximum of maize bags each one sold in a year, each bag having 50 kg. These numbers vary from 0 to 500, but the average from group A is 85, whereas group B sold 125 on average.

The number of months during which participant ate their own produced food is more consistent in the A group because almost all the participants with this information said 12 months (the average is 11,9 months); while in B the average is 11,1 months.

The next graph (Figure 4.9) represents the income level of the stakeholders. In group A, five participants have a medium income and the same number of high income. While the B participants are more distributed, having five people with low income, three with medium and four with high.

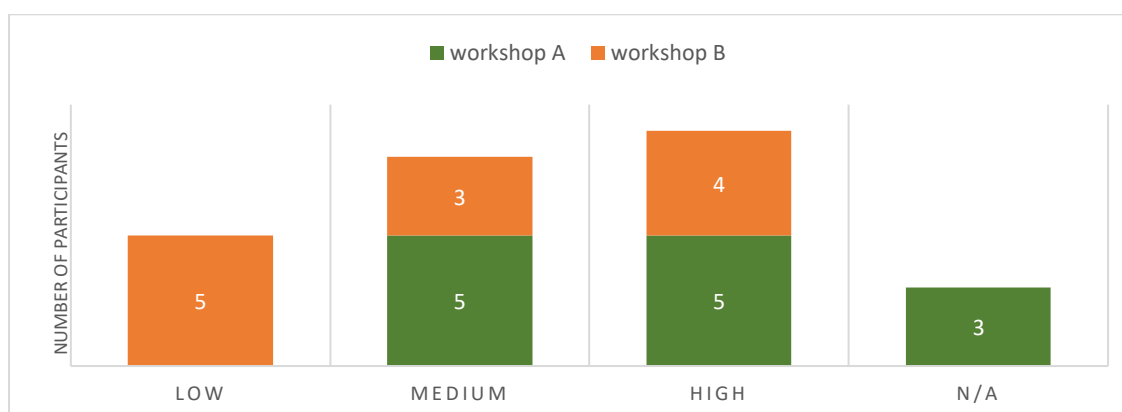


Figure 4.9 Participants by income classification – A and B workshops

Lastly, 62% of the participants from workshop A were in the previous workshop; on the other hand, 67% of the participants from group B attended the ST workshop, which took place in 2015.

Table 4.1 Characterization of participants in the scenario workshops in Zambia, in 2016

Workshop A/B	Stakeholder type	Stakeholders code	Gender	Village	Age	Marital status	Household size (ha)	Tillage Used		Level of education	Livestock (total)	Max. of bags of maize sold in a year (50 kg)	Months of own Food Consumption	Income classification	Participated in the workshop 2015
								Conservation Farming	Conventional Farming						
A/B	Interviewer	E01	M	-	-	-	-	-	-	-	-	-	-	-	-
		E02	F	-	-	-	-	-	-	-	-	-	-	-	-
		E03	M	-	-	-	-	-	-	-	-	-	-	-	-
		E04	M	-	-	-	-	-	-	-	-	-	-	-	-
		E05	M	-	-	-	-	-	-	-	-	-	-	-	-
	Respondent	P0X	F/M	-	-	-	-	-	-	-	-	-	-	-	-
	Respondents	P00	F/M	-	-	-	-	-	-	-	-	-	-	-	-
	Men	P0M	M	-	-	-	-	-	-	-	-	-	-	-	-
	Women	P0W	F	-	-	-	-	-	-	-	-	-	-	-	-
A	Participant	P01	F	Mpikwa	49	Divorced	5	Yes	Yes	Grade 9	35	20	12	Medium	Yes
		P02	F	Mpikwa	-	-	5	Yes	No	-	-	-	-	High	No
		P03	F	Mpikwa	40	Married	7	-	-	Grade 9	17	-	-	-	No
		P04	F	Chitumbo	57	Widowed	6	Yes	Yes	Grade 9	23	25	11	Medium	Yes
		P05	F	Mpikwa	53	Divorced	4	Yes	Yes	Grade 7	10	5	12	Medium	Yes
		P06	F	Mpikwa	52	Divorced	5	No	Yes	Grade 10	45	25	12	Medium	Yes
		P07	F	Mpikwa	70	Widowed	5	No	Yes	0	87	30	12	Medium	Yes
		P08	M	Mpikwa	54	Married	14	Yes	Yes	Grade 10	35	150	12	High	Yes
		P09	M	Mpikwa	52	Married	9	Yes	Yes	College	185	360	12	High	Yes
		P10	M	Mpikwa	-	Married	12	Yes	Yes	Grade 8	77	50	12	High	Yes
		P11	M	Mpikwa	31	Married	3	Yes	Yes	Grade 7	34	100	12	High	No
		P12	M	-	-	-	-	-	-	-	-	-	-	-	No
		P13	F	-	-	-	-	-	-	-	-	-	-	-	No
B	Participant	P14	F	Chitumbo	-	-	7	No	Yes	Grade 9	11	17	12	Low	Yes
		P15	F	Chitumbo	36	Divorced	13	No	Yes	Grade 7	5	10	12	Low	Yes
		P16	F	Chitumbo	40	Divorced	8	No	Yes	Grade 8	39	250	12	High	Yes
		P17	F	Chitumbo	37	Divorced	6	Yes	No	Grade 7	15	17	11	Medium	Yes
		P18	F	Chitumbo	40	Single	1	Yes	No	Grade 7	4	0	6	Low	Yes
		P19	M	Chitumbo	27	Married	4	Yes	No	Grade 12	22	25	12	Medium	No
		P20	M	Chitumbo	41	Married	7	No	Yes	Grade 7	23	5	10	Medium	Yes
		P21	M	Chitumbo	36	Married	11	Yes	Yes	Grade 12	104	500	12	High	Yes
		P22	M	Chitumbo	45	Married	10	Yes	No	Grade 12	37	427	12	High	Yes
		P23	F	-	-	-	-	-	-	-	-	-	-	Low	No
		P24	M	Chitumbo	-	-	10	No	Yes	Grade 9	35	110	12	High	No
		P25	M	Chitumbo	-	-	5	Yes	No	Grade 5	6	10	11	Low	No
	Group 1	G01	F/M	-	-	-	-	-	-	-	-	-	-	-	-
	Group 2	G02	F/M	-	-	-	-	-	-	-	-	-	-	-	-

4.3.2. Scenario Workshop activities

When conducting the workshops and due to the limitation of the scientific-based knowledge restriction of the participants, facilitators decided to adapt the original script (Appendix 1) and simplify it, since the aim was to educate the community on food security issues. The main differences with respect to the developed script were: the four different scenarios were not discussed, instead, the organizers focused on the considered worst scenario, so the participants could be prepared if this would happen, and there was no time left to develop a proper action plan.

With both groups, A and B, the same script was used, however, the second group had a different approach during the scenario activity. This different approach was dividing the group B into two groups, so they could find a solution for the scenario introduced. Additionally, the workshop flowed differently in both cases since some other questions and subjects were developed during the process. Finally, the transcriptions (Appendices 2 and 3) were translated to English and are in their original form, so it will be possible to consult the participants' line of thinking in the rawest data to shape collective mental models. The next table summarizes and guides the analysis of workshop transcriptions. Figure 4.10 and Figure 4.11 illustrate the workshop activities.

Table 4.2 Summary of the activities in workshops A and B

		Transcription page	
		A	B
Introduction	Round of introductions – name, where they come from, profession Presentation of workshop's intention/idea Workshop program and rules	103	159
Revision of the results from the ST workshop (2015)	What they learnt from the 1st workshop (ST workshop) Reminding the glasses of water activity (Figure 4.10) Asking the key questions: <ul style="list-style-type: none"> • What to do with cash? • How to increase/decrease cash? • How to get food? • How to improve land fertility/farming? • How to increase livestock? Building the Causal Map from the 1st workshop	104	161
Feedback from participants	What they manage to do after the previous workshop Possible difficulties/failures that the participants had	113	169
Scenario “no rain, no government help” exercise	Introduction of the “no rain, no government help” scenario Coming up with policy proposals to overcome the scenario and group discussion/explanation (Figure 4.11) Participants' plans for the future/Action Plan	124	174
Closure	Recap main insights and highlight the importance of planning Distribution of the Reports Cards/Booklets for self-monitoring	156	210



*Figure 4.10 Scenario Workshop – Glasses of Water activity (Revision of the workshop 2015)
(Source: Kopainsky, 2016)*



*Figure 4.11 Participants discussing policy proposals to overcome the scenario “no rain, no government help”
(Source: Kopainsky, 2016)*

4.4. Data processing and analysis

4.4.1. Coding Charts – coding method

The Coding Charts are the second output from the Coding Process, so as it was explained in the methodology section. After setting the workshop theme, purpose and also the research questions, the relevant data to meet these objectives was carefully selected. So, the variables and their relationship type were identified and described in charts according to its theme. Also in these charts is possible to know where the information comes from (information source), some notes and dictations that justify the relationship between the variables and also the speaker code and CIN. The Coding Charts are in Appendix 6 and Appendix 7.

Additionally, some variables and their relationship were mentioned by many participants, but only the first one is cited in the chart. Sometimes, there is more than one speaker name for each causal structure but the reason is that they were developing their line of thinking together, or added something important after. On the other hand, there are some participants, such as P03, P11, P13, P18 and P25 who did not add anything to the tables. One of the reasons can be that only one participant took part in the previous workshop, or might have been reluctant.

When the Coding Charts are analysed relatively to the participants in both groups it may be observed that men have intervened more. Even though the group A had more female participants, men contributed three times more with policy proposals variables than women and this also happened in group B, where men added more than the double of variables when comparing to the women. When it comes to the revision/lessons learned the ration between the interventions is more gender balanced. This probably happened due to their level education – male participants have a slightly higher formal education than the female, in this case – and also their opinion is not normally considered in the decisions at home. In group A, the person who contributed more to the Coding Charts was P09, with 49% of all the charts, including Lessons Learned and Policy Proposals; curiously, this man has a college degree, has a high income and access to food security all year. Finally, in group B there is a similar behaviour: a man, who participated in the workshop in 2015, who has a high income and has the higher educational level, contributed with 27% of the inputs to the coding charts; the participant is P22.

4.4.2. Words-and-arrows diagrams – coding method

The Words-and-arrows diagrams were made from the Coding Chart and aimed to simplify and to find the pathways between the causal arguments. In this case, there were found 108 causal arguments. This number is represented by a MIN so that it can be identified in the Causal Maps. During the development of the coding charts, there were some arguments described the same or even identical arguments, so they were put in the same MIN. The results can be found in Appendix 8 and Appendix 9.

4.4.3. Causal Loop Diagrams/Maps

The CLDs were formed at the end of the coding process, as explained in the methodology chapter. The next figures represent the result of the coding process – transcription, charts, words-and-arrows, CLD. The numbers (from 1 to 108) are the MIN (Map Identification Numbers) and can be found in the words-and-arrows appendices (Appendix 8 and 9). Additionally, the stocks and flows were not evidenced since it was not relevant to this research. For a better understand of the CLD notation, consult Appendix 10. The link colours have the meanings represented in Table 4.3.

Table 4.3 Legend CLD/Maps

Link colour	Meaning
Orange	Review mentioned by workshop group A
Blue	Review mentioned by workshop group B
Green	Review mentioned by workshops groups A and B
Yellow	Link created by workshop group A
Purple	Link created by workshop group B
Red	Link created by workshop groups A and B
Grey	Links that were created in workshop 1 (2015) that were not remembered

4.4.3.1. Lessons Learned from the System Thinking workshop

At the begging of both A and B workshops, the interviewers asked the participants to recap the CLD from the previous workshop (2015), to study how much they could remember after a year. There were five questions that they focused on during the workshop, those questions were: “*What to do with cash?*”, “*How to increase or decrease cash?*”, “*How to get food?*”, “*How to improve land fertility/farming?*” and “*How to increase livestock?*”. After the coding process, the results are shown in the next figures.

i. *What to do with cash?*

The CLD depicting the answers to the question “*What to do with cash?*” is shown in Figure 4.12. To answer this question, the participants thought not only in the first workshop but also in their daily lives, adding more variables and links to the system, which are: *Rain/Water*, *Personal Expenses*, *Savings* and *Piecework*. The other variables – *Land Owned/Rented*, *Inputs*, *Livestock*, *Disease Prevention* and *Food Purchases* were already in the final map of the workshop 2015. Starting with *Land Owned/Rented*, *Inputs* and *Rain/Water*, the money can buy or rent land, buy seeds, for example, and pay the water maintenance (water pump, for instance), to start farming. Also, money can also pay for *Livestock* and to maintain them – *Disease Prevention* – “(...) *there is cash for livestock, there is some medicine needed for livestock so that in the future your livestock can increase (...)*” (P09-113 p. 114/115, Appendix 2). Other things that they mentioned was they could buy food (*Food Purchases*); *Personal Expenses*, such as luxury, school, funerals; and even pay someone to work for them – *Piecework*. Lastly, they can “(...) *start budgeting, and have now started saving; having our own bank accounts where to save (...)*” (P07-391 p. 126, Appendix 2), so it means *Savings*.

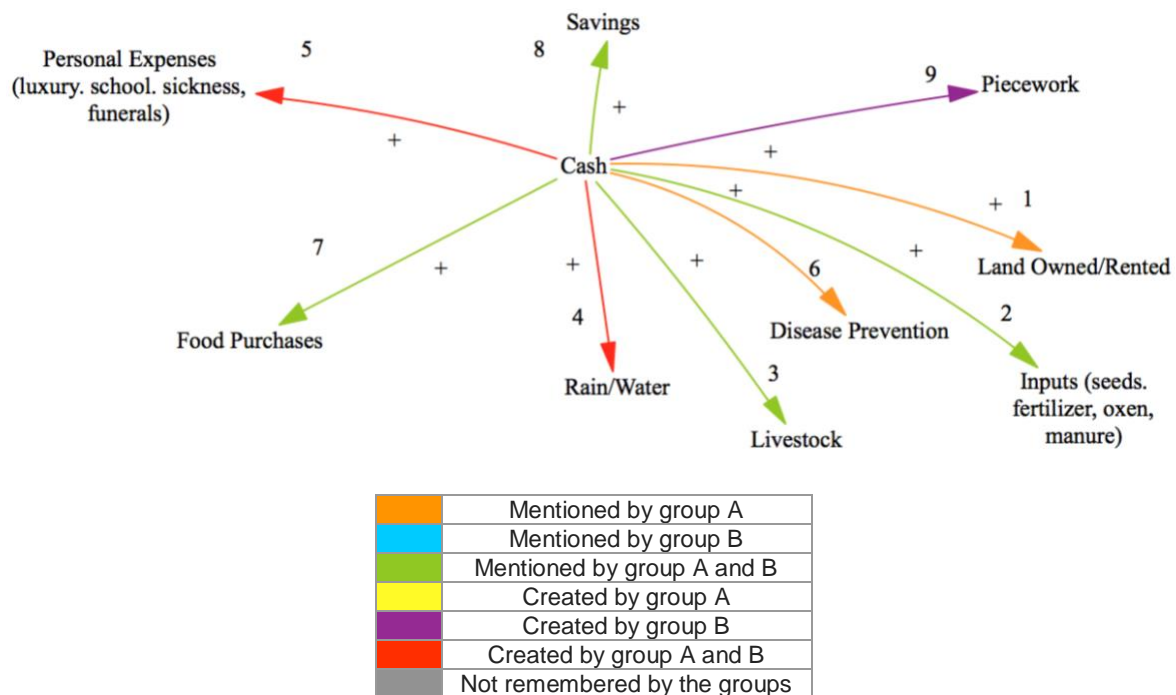


Figure 4.12 What to do with cash CLD – Lessons Learned

ii. How to increase/decrease cash?

In this revision question, there are some elements that may increase or even decrease the cash stock in the system. So, according to what participants said during the scenario workshops, the CLD depicted in Figure 4.13 was constructed.

According to the figure above, there are many ways that affect the *Cash* variable. When this part of the map is compared to the original one, there are some new variables, namely *Piecework*, *Climate Change*, *Trees*, *Charcoal*, *Loan*, *Groundnuts*, and *Commerce*; and new links between variables, such as 12, 13, 14, 20, 21, 22, 24 and 25. So, basically all types of business – *Gardening*, *Livestock*, *Commerce*, *Charcoal*, *Produced Food* and *Groundnuts* can affect the *Cash* variable, since they increase it when their business is going well. Using the *Produced Food* as an example, there is an external factor called *Climate Change* that affects in a negative way the rainfall: “*unstable weather conditions also reduce the cup of cash at home*” (P21-369 p.176, Appendix 3); the *Land (productive land)* depends on the *Rain/Water* to produce more food, but this amount has to be moderate. The other business kinds will be explained in the policy proposals section. Moreover, other ways to increase the *Cash* is *Avoiding Carelessness*, which is not buying anyhow or unnecessary things; ask for a *Loan* and do *Piecework*, that is work for others. Regarding this question, there is a balancing feedback loop (**B1**) between the *Charcoal* and *Trees* variables, that will be explained in more detail below, in the *Charcoal Business* proposal section. In this case, there was a leverage point identified: Changing the goals of the system – in this case, the current objective is to increase *Cash*. If the underlying goal changes to other goals, other than increasing *Cash*, this will have a high leverage in the system.

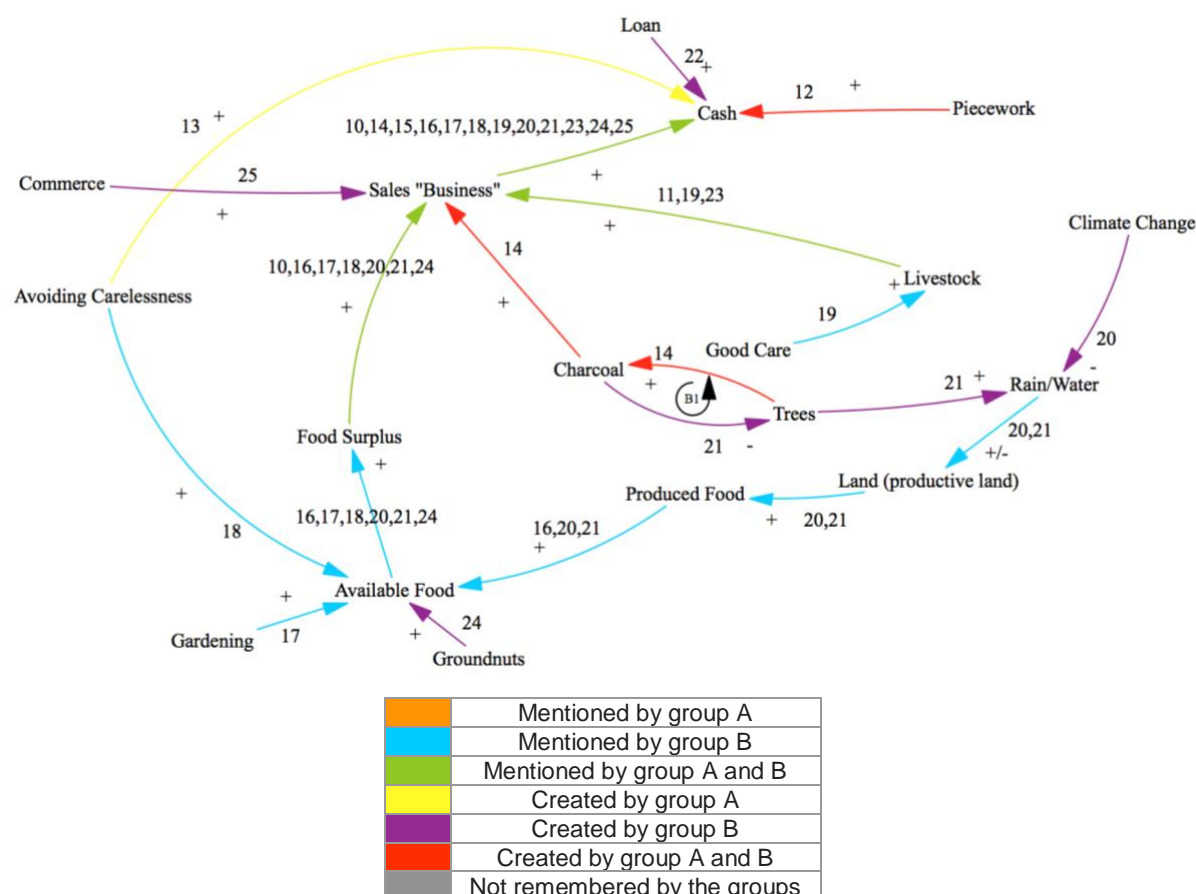


Figure 4.13 How to increase/decrease cash CLD – Lessons Learned

iii. How to get food?

To start with the Food Security theme the interviewers asked what/how the participants do to have/get food. Figure 4.14 provides their way of thinking.

In this situation, the only new variable is *Household Consumption* and its link (MIN: 32). *Livestock* contributes with *Inputs*, namely manure and oxen, to improve farming and consequently, the *Produced Food*. As well as *Rain/Water* that is also necessary to produce food and for the *Household Consumption*, that is used for cooking and for drinking. The *Rain/Water* can be a drawback "if there are floods again, you can do very well but the crops will be destroyed by the floods (...)" (P21-367 p. 176, Appendix 3).

When it comes to the *Available Food* variable, it can be influenced by *Avoiding Carelessness*, *Debt Avoidance* and *Abusive Sales*. If *Avoiding Carelessness* increases, the *Available Food* will also rise, because "(...) what makes our food reduce is our carelessness" (P17-306 p. 175, Appendix 3) and "on the part of food, it should also be managed well because there are pests that destroy... we should be buying medicine to prevent or to treat our food so that it can be free from pests" (P09-113 p.116/117, Appendix 2). The food availability decreases when farmers sell more food than they should, and not storing enough for their own consumption (*Abusive Sales*). Finally, "then on the cup for food, what can

make it reduce even when you had reserved enough are unnecessary debts” (P21-371 p. 176, Appendix 3), in other words, meaning that if I avoid more debt (*Debt Avoidance*) then I need to pay back (*Debt Payback*) less and thus I do not have to sell so much food to generate revenue for paying back debt, ending up with more food. There is one leverage point in this case, namely the size of debt stock relative to its flows.

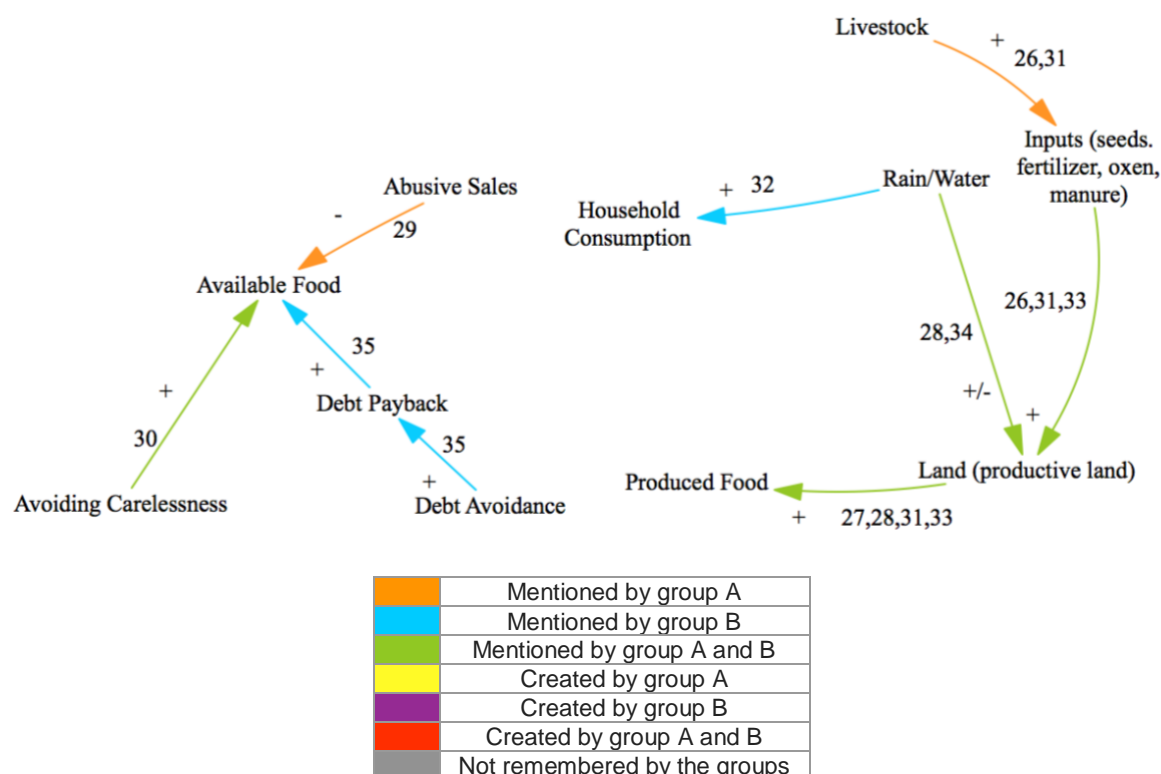


Figure 4.14 How to get food CLD – Lessons Learned

iv. How to improve land fertility/farming?

In this case the question was what could participants do to improve land fertility, however, they also found situations that could disturb farming (Figure 4.15).

In relation to the original map, participants added the following variables: *Piecework*, *Charcoal* and *Trees*. To improve land fertility they must have *Inputs*, which can come from *Livestock* or *Trees* manure (Musangu trees, for example) and also *Rain/Water* that are also influenced by the *Trees*. The other activities they can do to increase fertility are: *Conservation Farming* to avoid the use of tillage or only minimal tillage; *Liming*; *Weeding* the fields; *Crop Diversity* “we should not just plant one crop but a number of them, so that if our crop does not sell well, the other will and help again on the same crops” (P22-425 p. 178, Appendix 3); and *Crop Rotation* because “(...) if you over-use the land, it loses its fertility (...) why we learnt that we should be practicing crop rotation” (P09-113 p.116/117, Appendix 2). At the same time, there are some actions that harm the fertility of the soil such as *Piecework* and the reason is “we will always just be weeding other people’s fields while our fields suffer in the end hunger

(...)” (P14-419 p.177, Appendix 3); and also *Charcoal* since this business depends on the cut of *Trees* that are related to the rainfall. In this case, there is one leverage point that should be highlighted: Changing the rules of the system – this map has the main purpose of improving land fertility. Since the *Rain/Water* is essential for it, introducing the Charcoal Business will affect negatively the system; and that is what happens to *Piecework* as well.

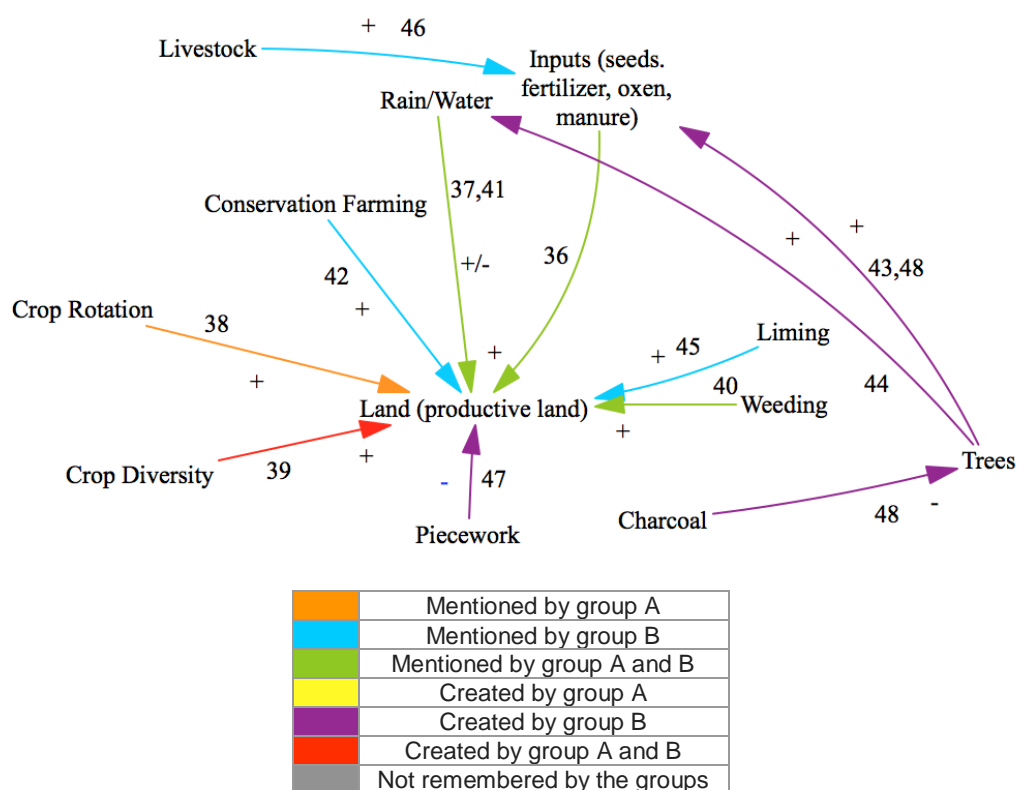


Figure 4.15 How to improve land fertility/farming CLD – Lessons Learned

v. How to increase livestock?

The last question of the revision was what could participants do to increase the number of livestock. Their answers are translated into the CLD in Figure 4.16.

In this case, neither new variables nor links were created. So, to improve the number of livestock, there is *Cash* so farmers can keep their animals and buy more; *Good Care*; *Disease Prevention* such as “some medicine needed for livestock so that your livestock can increase (...)” (P06-105 p.116, Appendix 2); and *Breeding* – “for cattle to be increasing, to be reproducing your desire should be that you look for a breed which is good (...)” (P09-187 p.120, Appendix 2).

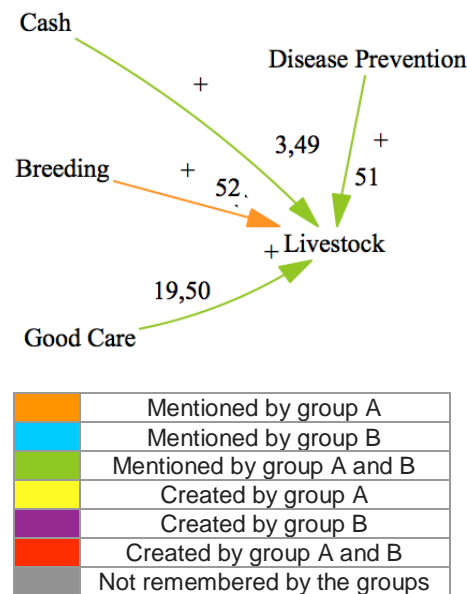


Figure 4.16 How to increase livestock CLD – Lessons Learned

vi. Integrated CLD depicting Lessons Learned from the System Thinking workshop

Combining all the causal maps above and adding the information which was still not mentioned from the causal map built during the ST workshop (2015), the integrated causal map of the Figure 4.17 was achieved.

When this integrated CLD is compared to the original one, it has more links, so it means participants added new variables and links between them. The causal map from the ST workshop has 28 variables and 37 links, while the Lessons Learned Causal Map has 39 variables and 55 links, that is an increase of 39% in the map for the variables and 49% for the links. Furthermore, some important variables like *Charcoal*, *Climate Change* and *Savings* were added to this new CLD, showing the acquired knowledge and perceptions of the participants.

When comparing results from both workshops A and B, participants could not remember 11 links, and 5 variables (*Desired Food*, *Proper Storage*, *Musangu Trees*, *Burning Land* and *Feed*) at the moment of the revision in the scenarios workshop. The two groups could remember 14 links (green) and the group A memorized 5 (orange), whereas group B learnt 8 (blue). Lastly, groups A and B created 6 links that match together (red), the group A alone just made 1 (yellow), while group B generated 10 new links (purple). The grey links, those that were not remembered by any of the two groups, totalled 8. To summarize, group B remembered and created more links than group A, the reasons can be because the interviewers asked more specific questions, the average educational level in the group B (Grade 9) is higher than the group A (Grade 8), and the group B had more registered participants (67%) that took part of the previous workshop, when it is compared to the other group (62%).

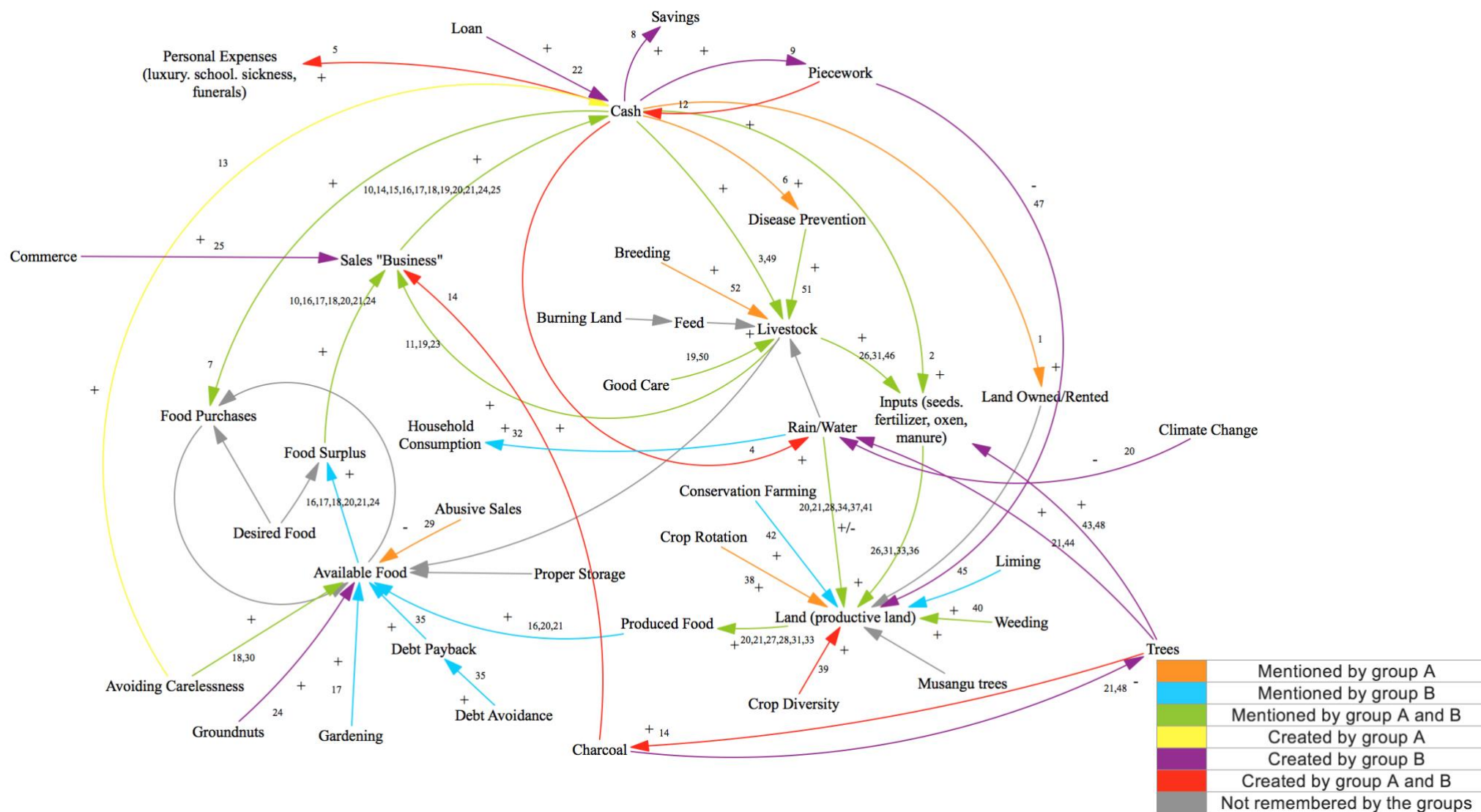


Figure 4.17 Lessons Learned Final Causal Map (workshops A and B – April 2016)

4.4.3.2. Policy proposals under a worst case scenario

After the revision, the interviewers introduced a scenario – “no rain, no government help” – that is considered the worst scenario possible for the participants, and the exercise was to find policy proposals to defeat this kind of scenario, so they could reach Food Security even in this case. Even though, the group A and B had the workshops in two different days, in this document the policy proposals will be shown all together, not differentiating per group because both groups could add important information for each policy. The policy proposals will be separated as “Strengthening policies” and “New policies added”. In one hand, “Strengthening policies” are policy proposals that already existed in this map but come to reinforce and/or have different pathways – Charcoal Business (A), Livestock Business (B), Groundnuts Business (C), Gardening (D), Loan (E), Piecework (F) and Land (productive land) (G). On the other hand, the “New policies added” include all the new policies/variables added to the Lessons Learned Causal Map – Rental Business (H), Partnership (I), Legislation for Deforestation/Afforestation (J), and Retention Basins/Drilling Boreholes (K), by participants of the scenario workshops.

The next maps have new links and variable compared to the Lessons Learned Final Causal Map (Figure 4.17). The reason is that they were added during the scenario workshops, however, after the revision of the ST workshop (2015). These new links and variable are relevant but cannot be considered as individual policies, additionally, they are transversal to all the following policy proposals. The new variable is *Government* and the new links are the one who connects *Government* to *Inputs* (*seeds, fertilizer, oxen, manure*) (MIN: 77), since the government provides inputs to the farmers; the link between *Rain/Water* and *Household Consumption* (MIN: 32); and the connection among *Available Food* and *Household Consumption* (MIN: 71, 94, 103). Moreover, since the *Musangu Trees* were too specific, it was changed to *Trees*, so could work better on the maps. Also, the links related to the policy proposals are in bold and the remaining in grey; the link colours can change from the Lessons Learned Causal Map because the group A can mention something that did not say before in the revision, for example.

A. Charcoal Business

Figure 4.18 represents the *Charcoal Business* proposal, which is burning charcoal from trees. In this policy, *Health* and *Legislation for Deforestation/Afforestation* were added to the Lessons Learned Causal Map. The pathway starts with *Trees* that are cut down to produce *Charcoal*, then it goes to *Sales “Business”* so they can earn *Cash*, so they can buy *Livestock* or food (*Food Purchases*), consequently, they can have *Available Food*, thus Food Security. On the other hand, “when you burn your charcoal that ashes there it can destroy the land and crops cannot grow well” (P09-1533 p. 121, Appendix 2), therefore the *Land (productive land)* is affected in a negative way, also the *Rain/Water* since the *Trees* are reducing when *Charcoal* is increasing and, finally, also the *Health* will decrease with this business, because of the inhalation of the carbon dioxide, which can lead to several diseases. When it comes to the proposal *Legislation for Deforestation/Afforestation* that will be mentioned later in this chapter, it can reduce or even motivate the *Charcoal Business*. According to the stakeholders, the

reason is that the participants suggested that the Headman should permit if each person could practice this business, depending on the reasons presented by each household.

In this case, there is just one feedback loop relevant for the policy – the one between *Charcoal* and *Trees* – which is a balancing loop (**B1**) since when the *Trees* increase, the *Charcoal* also increases, but after it reduces de *Trees*.

B. Livestock Business

Livestock Business corresponds to the trade of livestock – chicken, goats, cattle – for money. Figure 4.19 shows all the links and variables related to this business, as cited by the participants.

In this CLD, the only variable added was *Transportation*. However, three links around *Livestock* were created – from *Piecework*, *Cash* and *Abusive Sales*. There are two ways to start this business – *Cash* and *Piecework*. To earn *Cash* is possible to ask for a *Loan* from AGORA or OSAWA; still, from *Produced Food*, it is possible to find *Cash* through selling the *Food Surplus* (k1000), after an amount (k500) is used to buy *Livestock* (buy 2 goats, k250 each). This *Livestock* is sold at a place where they are overvalued (*Sales Business* at Kasumbalesa), so they can find some profit. Other expenses like *Transportation* until the marketplace (k30), *Food Purchases* for the day (k80) are also taken into account. In this example, the profit would be k280. Nevertheless, there are other expenses related to livestock – *Good Care* (place to sleep), *Water* to drink, *Feed*, *Disease Prevention* (medicine, dipping, deworming). If a person cannot find the money to start this business, it is feasible to work for others – *Piecework* – and be paid through livestock (chicken) and to breed them (*Breeding*). The *Livestock* also contributes to the *Inputs*, since their manure and oxen can be used in the food production. It is important to highlight that the *Abusive Sales* of *Livestock* affects this proposal, meaning that they should avoid selling too much livestock. Like the Saldarriaga et al. (2014) research, the stakeholders came with the idea of selling animals, in order to buy food.

There are four feedback loops relevant to this policy, all reinforcing and which the first three are very similar. The **R1** represents the loop *Cash* → *Disease Prevention* → *Livestock* → *Sales “Business”* → *Cash*, while **R2** symbolizes *Cash* → *Livestock* → *Sales “Business”* → *Cash*, and lastly, **R3** is *Cash* → *Good Care* → *Livestock* → *Sales “Business”* → *Cash*. The **R4** characterizes the following links *Available Food* → *Food Surplus* → *Sales “Business”* → *Cash* → *Food Purchases* → *Available Food*.

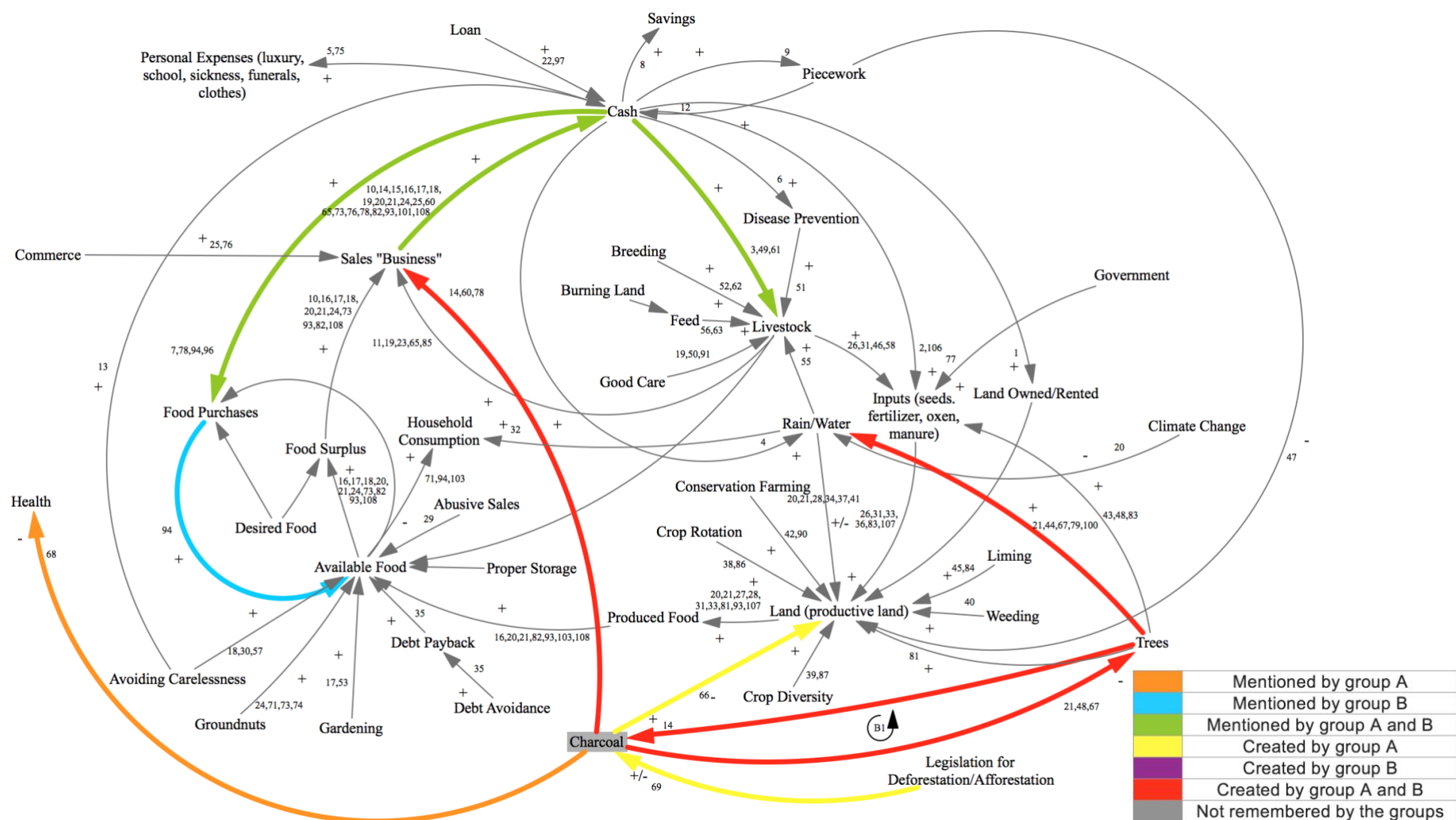


Figure 4.18 Charcoal Business policy proposal CLD – Strengthening policies

C. Groundnuts Business

The Groundnuts Business proposal was contemplated by the participants due to the capacity to grow these nuts in situations of low rainfall. Figure 4.20 provides the pathways and links of the groundnuts proposal.

The only variable added was *Health*, that already appeared in the Charcoal Business proposal. There are two connections added to this proposal, one that links *Groundnuts* to *Inputs* – “they have nutrients to support the crops you planted” (P09-1525 p. 157 Appendix 2); and other which links to *Health*, the participants affirm and recognize the nutritional capacities of groundnuts, meaning that this can benefit their health. So, starting with *Groundnuts* it is also possible to increase the *Available Food*, one part goes to *Household Consumption* and the other can be sold in order to find *Cash* and to buy more food (**R4**). From the money earned from this business is possible to buy *Livestock* or pay *Personal Expenses* – “from groundnuts, they find a lot of money even a cow they can buy but they only buy clothes” (P09-1456 p. 154, Appendix 2).

D. Gardening

Gardening is an activity that participants are used to doing, but in the case of a worst case scenario with poor rainfall, the participants noticed this would not be a good proposal. Figure 4.21 shows their way of thinking.

First, participants thought *Gardening* could increase the *Available Food*. Nevertheless, *Gardening* depends on *Rain/Water*, so this proposal was no further developed – “(...) I cannot do even a garden because there are no rains meaning there is no water” (P05-717 p. 137/138, Appendix 2). Later in this section, there will be a proposal called Retention Basins/Drilling Boreholes (K), which aims to collect and reserve water for the poor rainfall seasons, so *Gardening* could work if this proposal would be implemented as well.

E. Loan

The Loan proposal refers to a credit taken from agencies, for instance, OSAWA and AGORA. The participants can ask for a loan (money or livestock) in exchange for future payment amount along with interest or other finance charges. In Saldarriaga et al. (2014), this proposal was also cited as borrowing money so they could pay for farming inputs. Figure 4.22 represents this proposal and what participants suggest doing with a loan.

Since this proposal is a way to find *Cash*, smallholders can find more *Cash* or *Food Security*, the extra variables are related to another proposal – Rental Business – which will be explained in the section “New policies added”. The new link is between *Cash* and *Debt Payback*, and the reason is if there is enough money, is possible to pay back with the interested required. Thus, starting with the *Loan* that provides *Cash*, this variable can be used to start to build the houses for the Rental Business, forming a

reinforcing loop (**R6**); or to buy *Livestock* (explained previously in the Livestock Business); or to purchase *Inputs*, so they can apply them in the land to produce food, to achieve Food Security at home (*Household Consumption*) and to sell the *Food Surplus*, increasing the amount of *Cash* (**R5**). In other words, and according to P21-2012 p. 213/214, Appendix 3: “*Well, then he produces and raises a k400, he pays for FISP and they give him 4 bags (50 kg each) of fertilizer, he then cultivates and he reaches a level of producing enough food for consumption and be able to sell some. When he reaches that level, it means that he is also in the position to build a house that will be giving him money so that children can use it future*”.

F. Piecework

Piecework is a type of work which the payment depends on the number of things finished relatively to the time spent making them. In Zambia, this type of work consists normally in doing weeding and cultivating, during the rain and cold season, respectively, while in the hot season, is common to hire ox-carts (Saldarriaga et al., 2014). In this case, the piecework studied was cultivating on someone else's field and ox-carts. Figure 4.23, provides the CLD built for this proposal.

In this situation, no new variable was added to the system map, just some connections between them. Beginning with the Ox-carts, they need wood as their principal material, so this *Piecework* influences negatively the *Trees* and consequently the *Rain/Water*, according to P21-1986 p. 213, Appendix 3 “*the water is going down because where 10 ox-carts can come from its deforestation, destroying the land*”. Moreover, this piecework also destroys the *Land Owned/Rented*. On the other hand, this policy can increase *Cash* through selling 10 ox-carts for k20 each. With the half of amount of money, the participants suggested starting a new business – fritters (*Commerce*) – to start it they buy the ingredients they need (*Food Purchases*), like flour, sugar, salt. After selling the fritters they earn *Cash*, constituting a reinforcing loop (**R7**). Moreover, in the Saldarriaga et al. (2014) research, the farmers came up with this solution for the same purposes, however, ‘piecework’ is called ‘working off-farm’.

Hence, during the scenario workshop, piecework was discussed through the following connections: it is possible to buy piecework from other person and also to sell piecework for another person (**R8**); the *Piecework* can be paid with *Livestock*; and also, when a person works too much in other's field, their own field will decrease the production (*Land (productive land)*).

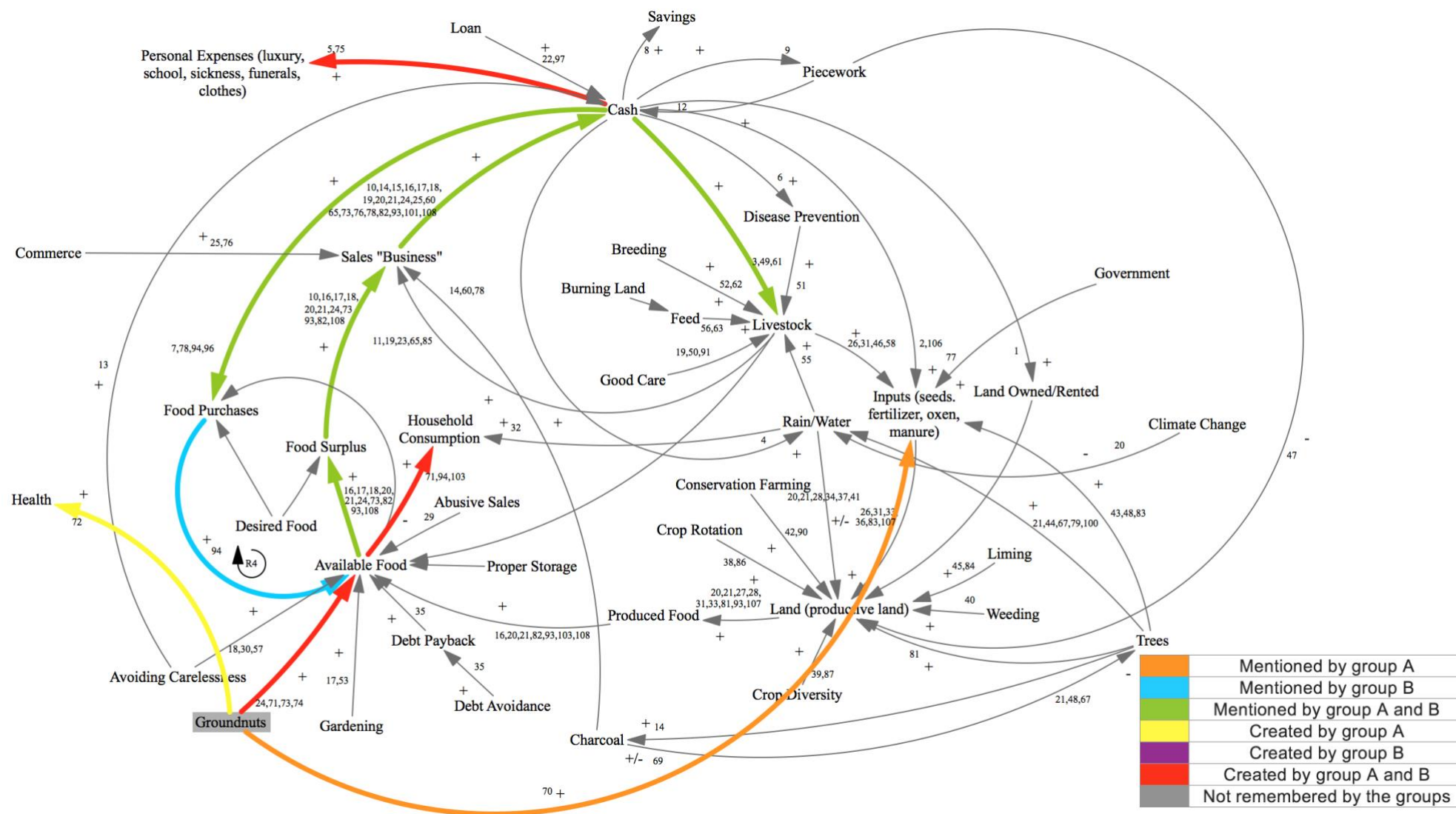


Figure 4.20 Groundnuts Business policy proposal CLD – Strengthening policies

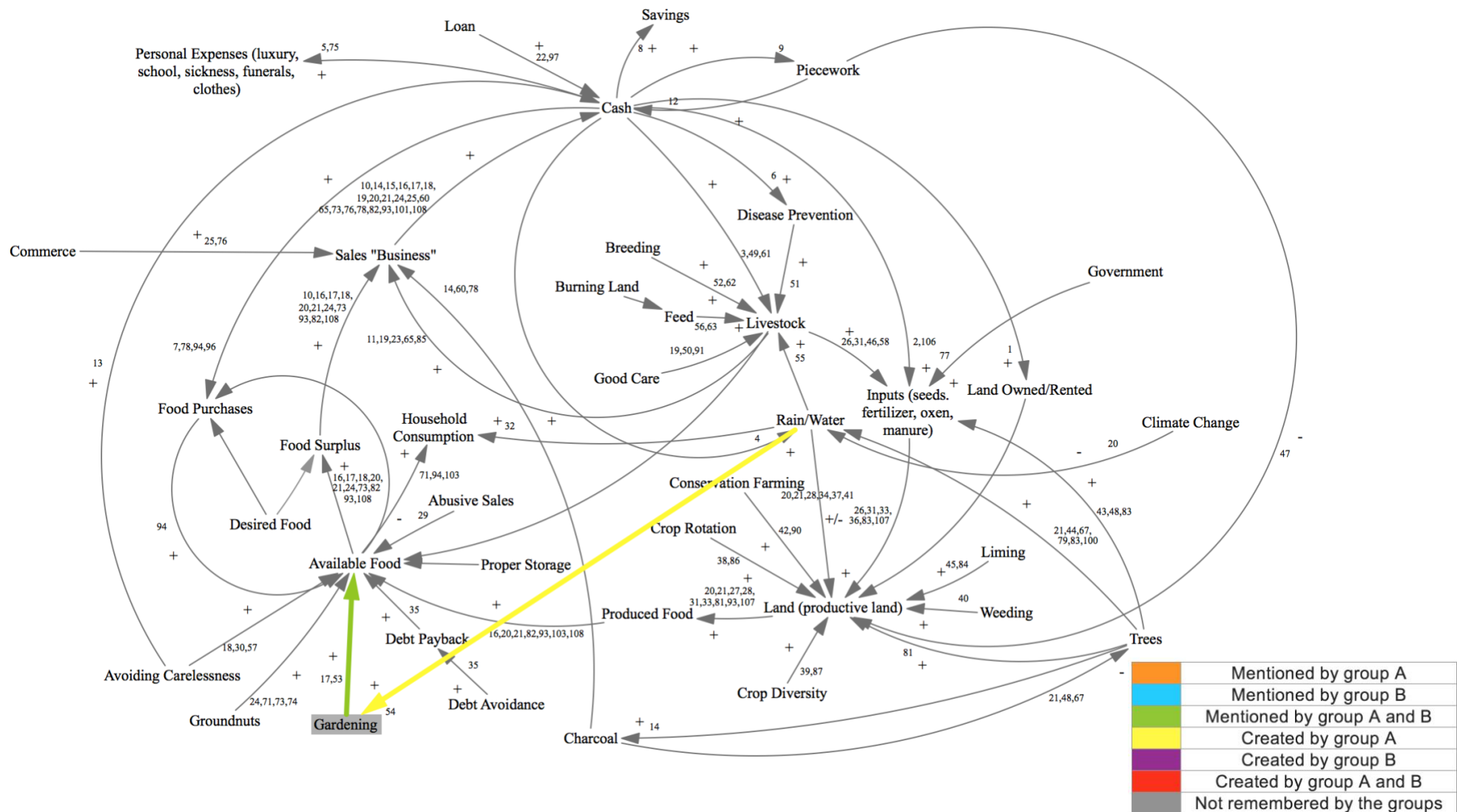


Figure 4.21 Gardening policy proposal CLD – Strengthening policies

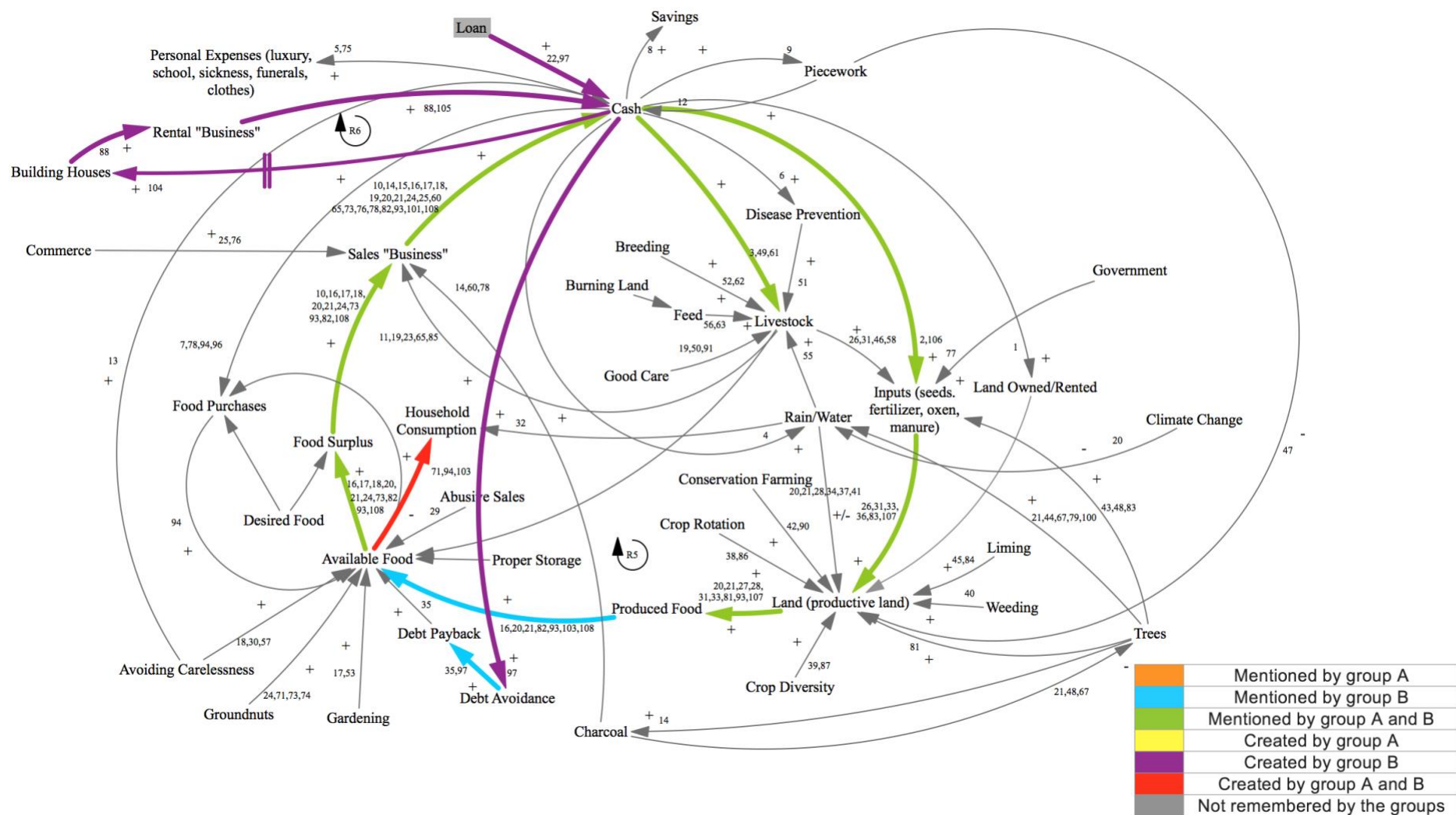


Figure 4.22 Loan policy proposal CLD – Strengthening policies

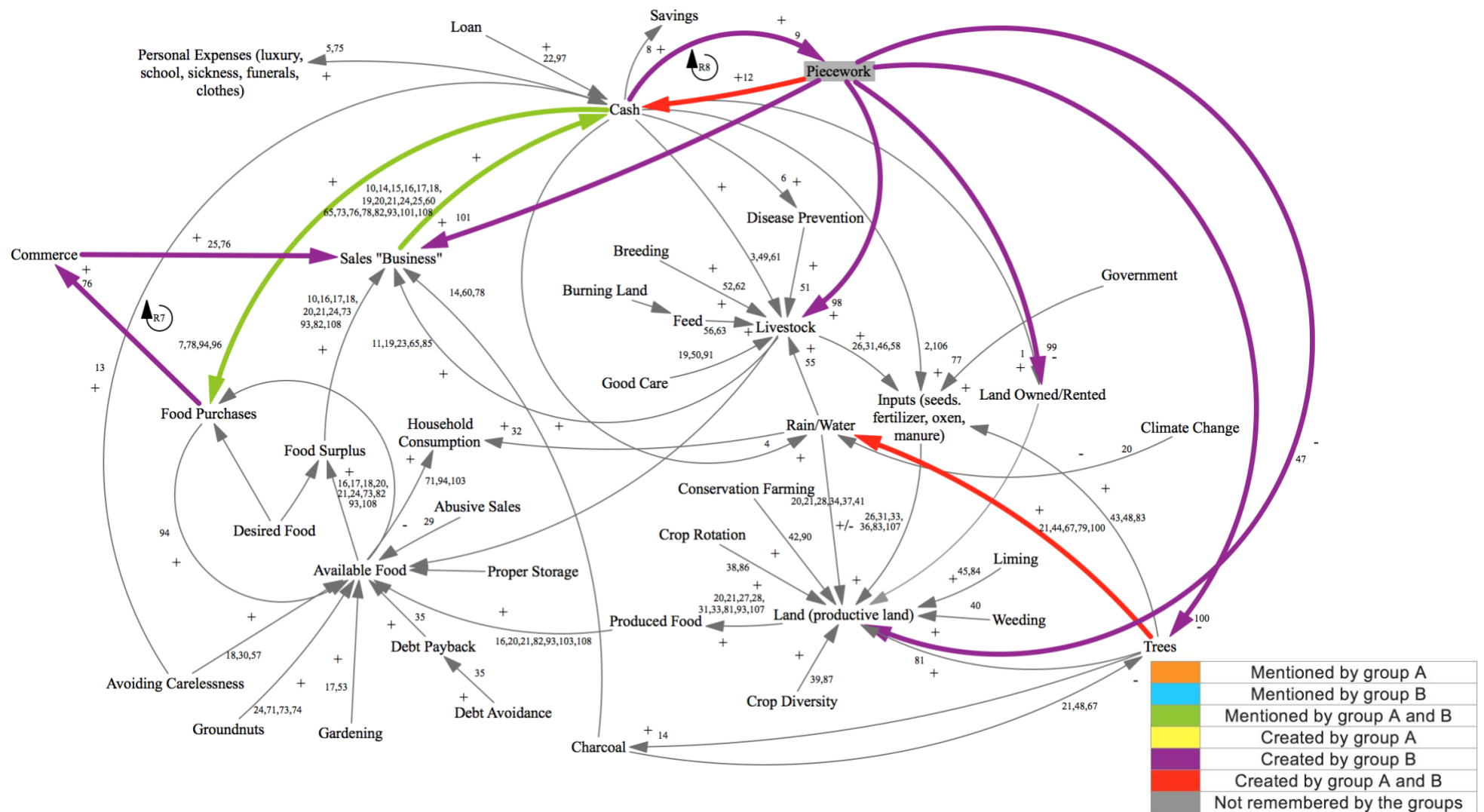


Figure 4.23 Piecework policy proposal CLD – Strengthening policies

G. Land (productive land)

This proposal shows how participants could join ways to improve land fertility, without the government's help with the fertilizers. Figure 4.24 depicts all the alternatives for overcoming the issue of soil inputs.

In this case, all the alternatives were already in the Lessons Learned Causal Map, so this proposal just came to reinforce these ideas because of all increase the land productivity without the help from the government. *Crop Rotation* is "(...) *changing of crops so that the soil is revamped*" (P24-924 p. 189, Appendix 3); *Crop Diversity* means planting many species in the crops so some can resist the weather unpredictable conditions. Other strategies include *Conservation Farming*; *Inputs* from livestock manure/stool, manure from the *Trees* and *Liming*. Reviewed literature (e.g. Saldarriaga et al. (2014)) suggests, similar policy proposals, such as 'getting inputs, pre-tillage, tillage, liming' and 'weeding and spraying'.

H. Rental Business

This proposal was presented for the first time in the scenario workshops. The main goal is to build houses so they can be rented in the future and earn money for their children. Figure 4.25 illustrates the CLD pathways.

For this proposal, two variables were added – *Building Houses* and *Rental Business*; consequently, other connections were created. Starting with the *Produced Food*, some of the production is reserved for *Household Consumption* and "*what remains you sell and then the money you keep it to say this money should be used to build a house so that in the future helps me*" (P21-2012 p. 213/214, Appendix 3). Then, it is necessary to find a strategic place (Kabwe, Chimbombo or anywhere where there are a lot of people, as the participants cited) where the house can be built, hire a bricklayer, buy materials, and until the house is ready for rent it takes seven years, that is the reason for the delay mark, identified by the participants. Afterwards, the *Rental Business* increases the *Cash* variable and with that money is possible to buy *Inputs* or *Livestock*. Other alternatives to start this business is with the *Livestock Business* or a *Loan*, like was explained previously. There is two reinforcing feedback identified – **R5** and **R6** (explained previously).

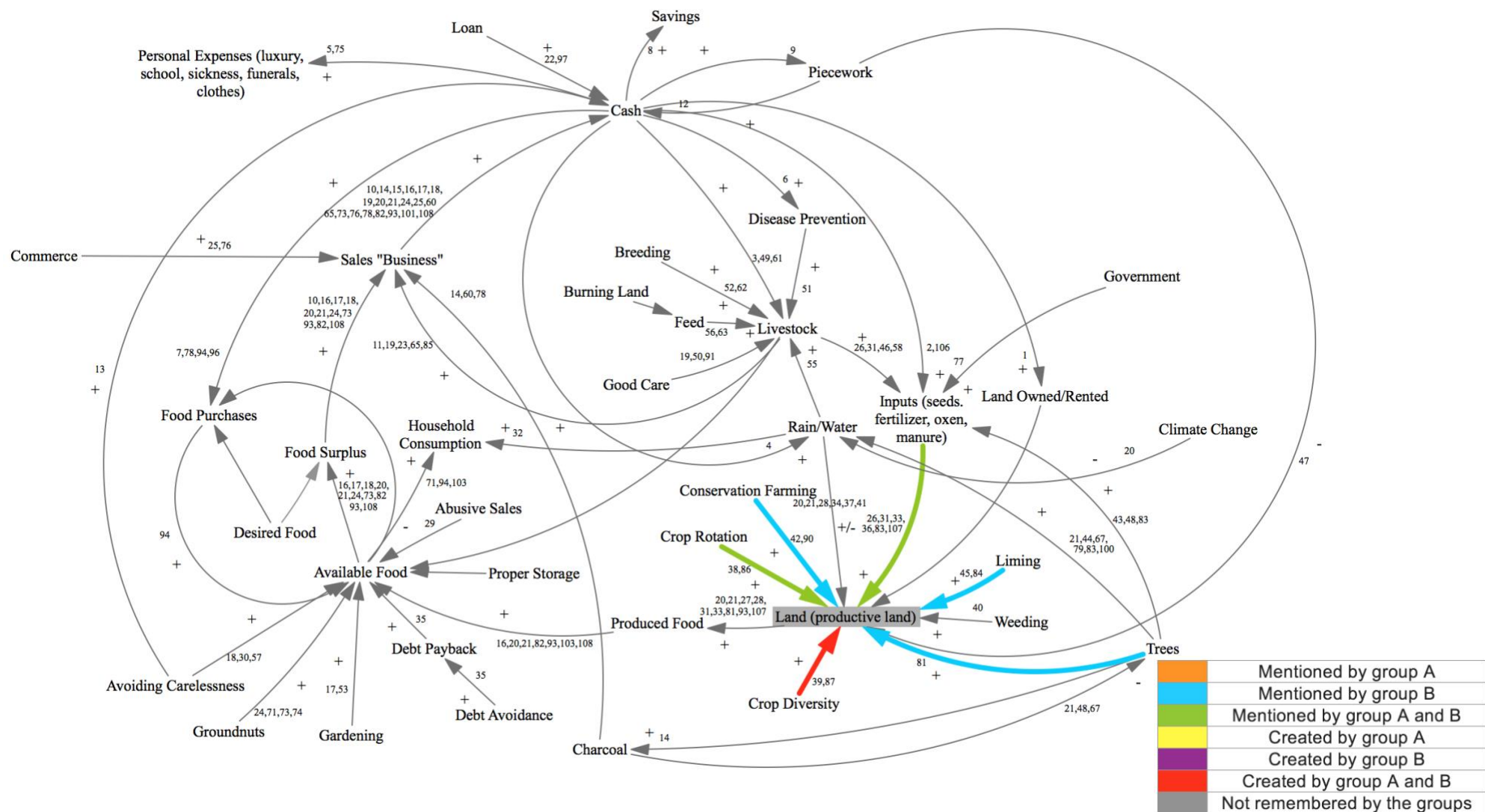


Figure 4.24 Land (productive land) policy proposal CLD – Strengthening policies

I. Partnership

Partnership proposal means working with someone as a society and working/contributing to the same goals to advance their interests. The resulting CLD is represented in Figure 4.26.

Partnership variable was added to the map and its link to *Land (productive land)*. Working with someone can be positive or negative depending on how committed is the partner. So, when “*they cultivate for you in a good time*” it is possible to produce food and sell it (*Sales “Business”*) in order to earn cash (P19-1491 p. 203, Appendix 3). “*But others will cultivate for you late such that before the cups can completely mature the rains stop*” (P19-1493 p. 203, Appendix 3)

J. Legislation for Deforestation/Afforestation

This policy consists of defining rules that aim to reduce or even mitigate the deforestation and to motivate afforestation. Figure 4.27 supplies all the possible links and their consequences when implementing this proposal, as cited by the participants.

In this case, the only variable added was *Legislation for Deforestation/Afforestation* and its links to *Charcoal* and to *Trees*. With afforestation, the number of *Trees* will increase and consequently will help the rain patterns (*Rain/Water*) and also the *Inputs* with their manure. Those “*trees in the field they start shedding off the leaves and when you cultivate you are able to find food*” (P20-1137 p. 194, Appendix 3), achieving Food Security. It is also possible to find profit from the *Trees* since the fruits from them can be sold (*Cash*). Additionally, this proposal can affect the *Charcoal Business* in a reinforcing or balancing way, and as already explained previously. According to the participants, *Charcoal Business* could be practice by a person who could explain his/her intentions to the government, if the intentions would be valid (for instance, do not have other option to earn money to buy food or to pay the school for the children), the person would have the permission to cut down trees. However, the person could be hiding his/her true intentions and necessities.



K. Retention Basins/Drilling Boreholes

These two methods – Retention Basins and Drilling Boreholes – were added to solve the water problem reflected in the worst case scenario. Retention Basins are dug in order to maintain water in case of floods or rainfall, which contributes to the provision of water courses during droughts, among other advantages. While boreholes are drilled in the ground in order to extract water from the aquifer. Figure 4.28 shows this proposal related to Rain/Water.

This proposal forms a balancing feedback loop (**B2**). Since “(...) *in times of little rainfall use retention basins*” (P05-1238 p. 149, Appendix 2) the water will be available, and also extract water from boreholes when there is the need. In other words, when the *Rain/Water* increases, the necessity of *Retention Basins/Drilling Boreholes* decreases; however, when the *Retention Basins/Drilling Boreholes* increase, the levels of *Rain/Water* available also grow.

4.4.3.3. Integrated CLD combining all policy proposals

After combining all the 11 policy proposals explained before, the final map is represented by Figure 4.29. In this final Causal Map, that has all the results from the coding and analysis of the Lessons Learned and Policy Proposals workshop activities are possible to observe how the policies work together and how can they influence each other. This map has 47 variables and 79 links, of which 5 were mentioned by the group A (orange), 8 by the group B (blue) and 20 by both groups (green), those variables were already in the original map. When those links are compared to the links of Lessons Learned Causal Map (Figure 4.17) both groups could remember 6 more links than in the revision part. Many connections were created during this exercise, so the group A could create 6 more links than in the first part of the workshop, counting 7 in total (yellow); while group B doubled the connections generated, regarding 21 in total (purple); and lastly, they produced 11 links together, so more 5 than before. Additionally, the grey links were reduced from 11 to 7, so it means they could remember more connections after the revision exercise.

The CLD size had an increase of 44% from the Lessons Learned version and 114% from the original one (ST workshop 2015) when it comes to the links. Moreover, related to the number of variables, the CLD also improved 21% and 68%, when comparing to the Lessons Learned and ST workshop (2015), respectively. Just as it happened before, group B's contributions had stood out from A's and the reasons are probably the same of the Lessons Learned causal map, i.e. group B participants were more motivated to talk, the average educational level is higher in B and this group had more participants who participated in the first workshop.

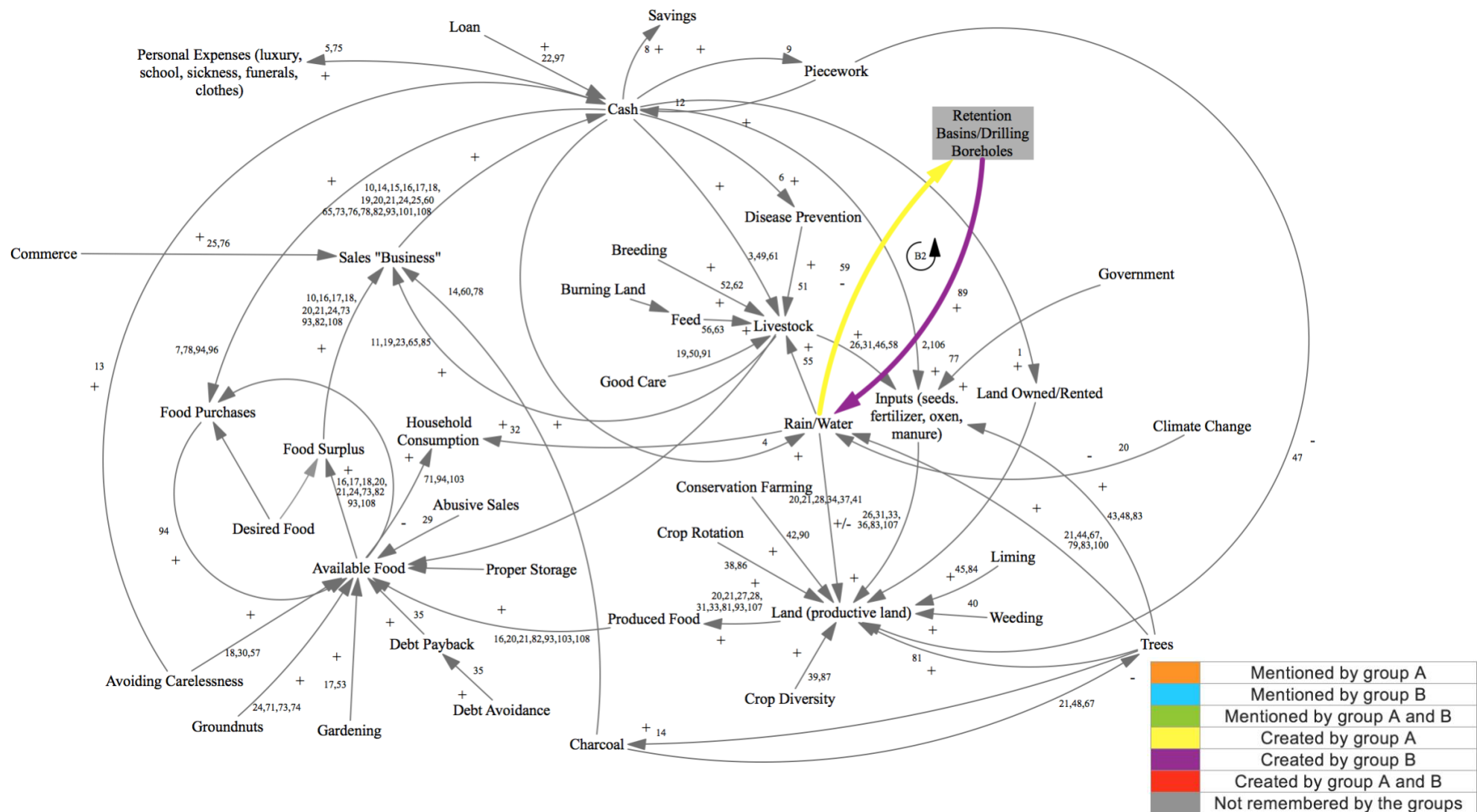


Figure 4.28 Retention Basins/Drilling Boreholes policy proposal CLD – New policies added

4.4.4. Prospecting interrelationships between the policy proposals

This section will show the study of interrelationships among the policies, if they do not affect, complement, harm each other, in other words, to evaluate the dependability between them. The following results were made by the author based on the workshop transcriptions and Policy Proposals Final Causal Map (Figure 4.29). Additionally, this section was based and adapted from methodologies used in the Videira et al., 2014 paper. The next table shows the result of the cross-impact analysis.

Table 4.4 Cross-impact matrix for the policy proposals (Adapted from Videira et., al 2014)

Proposal effect:		from	on	A	B	C	D	E	F	G	H	I	J	K	AS	%
Charcoal Business	A				1	0	0	0	0	1	0	0	0	0	2	66,7
Livestock Business	B	0		0		0	0	0	0	0	0	0	0	0	0	0
Groundnuts Business	C	0	0		0		0	0	0	0	0	0	0	0	0	0
Gardening	D	0	0	0		0		0	0	0	0	0	0	0	0	0
Loan	E	0	1	0	0		0		0	1	1	0	0	0	3	100
Piecework	F	0	1	0	0	0		0		1	0	0	0	0	2	66,7
Land (productive land)	G	0	0	0	0	0	0		0		0	0	0	0	0	0
Rental Business	H	0	1	0	0	0	0	0		1		0	0	0	2	66,7
Partnership	I	0	0	0	0	0	0	0	1		0		0	0	1	33,3
Legislation for Deforestation/Afforestation	J	1	0	0	0	0	0	0	1	0		0		0	2	66,7
Retention Basins/Drilling Boreholes	K	0	0	0	0	0	0	0	0	0	0				0	0
	PS	1	4	0	0	0	0	0	0	6	1	0	0	0		
	%	16,7	66,7	0	0	0	0	0	0	100	16,7	0	0	0		

The aim of this table is to calculate and simplify the causal effect from each proposal in one other, because depending on the magnitude of their influences the proposal, should be implemented in an integrated way, or not. Therefore, explaining the table values, the value 1 was given every time that the proposal has an effect on another, which can be positive (reinforcing) or negative (balancing or even reverse); while 0 means that no apparent influence was found from a proposal on another. Subsequently, the values PS (Passive Sum) and AS (Active Sum) were calculated, in the following way: dividing each sum of a column (PS) or arrow (AS) by the major PS and AS, correspondingly.

To demonstrate how the table was built the policy proposal Charcoal Business (A) will be explained: the first step is to verify all the influences this proposal has on the others – with Charcoal Business is possible to buy Livestock (B) and to start a business, so this relation has a 1 value; this also affects the Land (productive land) (G) because of the ashes and pollution, even though this is a drawback it is considered a 1 value; the rest of the policy proposals are not affected by Charcoal Business in a direct

way, according to the CLD derived from the workshop (Figure 4.29). After summing this value, the AS is equal to 2, and after calculating the AS percentage the result is 66,7%. On the other hand, Charcoal Business is affected by Legislation for Deforestation/Afforestation and only from this policy. That is why the PS is equal 1 and its percentage is 16,7%.

When evaluating the cross-impact matrix, all the relations and causal effects mentioned during the workshop seem plausible. In addition, the Gardening and Retention Basins/Drilling Boreholes could work together because the first needs water and the second one provides it. This situation was not considered in the CLD and the cross-impact matrix because it was not mentioned by the stakeholders directly.

After building the table, it is conceivable to build a diagram, crossing the AS and PS results. The diagram has four quadrants – “Critical”, “Reactive”, “Buffering” and “Active”, as shown in the next figure.



Figure 4.30 Diagram from the results from the cross-impact matrix (Table 4.4)

This figure represents a graphic and very accessible way the influences between the policy proposals. In this case, none proposal was considered “Critical”, i.e. this kind of policy would be very sensitive with other policy proposals, being influenced and influencing in a strong way; this type of proposal would request a deeper evaluation about their complementary.

The policy proposals Land (productive land) is considered the most “Reactive” one, nevertheless, Livestock Business was also considered “Reactive”, since in this case they do not affect any of the others (AS = 0%) but are highly influenced by the other policy proposals.

Four policy proposals were considered “Buffering”, meaning that Retention Basins/Drilling Boreholes, Gardening and Groundnuts Business are totally indifferent to the other policy proposals, since AS = PS = 0%, further the Partnership was also considered in the “Buffering” zone because has a slightly influence on the Land (productive land).

Finally, the “Active” zone has the most part of the policy proposals, in total five, that are Charcoal Business, Rental Business, Piecework, Legislation for Deforestation/Afforestation and Loan, which the most active one is the Loan (AS = PS = 100%); this quadrant means these policies have a great impact on the others, though they are less influenced by them.

4.4.5. Outlining policy proposals pathways

This section is the last step to build the Action Plan Outline with the pathways for each proposal. The next table (Table 4.5) supplies a summary with the insights captured during the transcription analysis of each proposal. Table 4.5 has four stages: the entry points for implementation, i.e. what each proposal needs to be implemented (stage 1); the stages 2, 3 and 4 are the causal effects from the policy proposals in a short-term (less than 1 year), medium-term (between 1 and 5 years) and long-term (more than 5 years), respectively; lastly, there is an area to comment the complementarity between the policy proposals, system risks, uncertainties, side-effects and other additional comments. The results from the table are all based on the transcriptions from the workshop, their causal maps and the cross-impact analysis presented in the previous section.

Table 4.5 Outline of the policy proposals pathways

Policy proposals	Cause-effect pathways traced with the causal loop diagrams				
	Stage 1 Entry points for implementation	Stage 2 Short-term causal effects (less than 1 year)	Stage 3 Mid-term causal effects (between 1 and 5 years)	Stage 4 Long term ultimate ends (more than 5 years)	Complementarity between policy proposals, system risks, uncertainties, side-effects and additional comments
Charcoal Business (A)	<ul style="list-style-type: none"> Burn Trees 	<ul style="list-style-type: none"> Earn cash Food Purchases Achieve Food Security Buy Livestock Land fertility/productive land reduce Reduce the number of trees Breathing problems 	<ul style="list-style-type: none"> Health problems (asthma, tuberculosis) Rain issues Earn cash Food Purchases Achieve Food Security Buy Livestock Land fertility/productive land reduce Deforestation 	<ul style="list-style-type: none"> Health problems (asthma, tuberculosis) Rain issues Land fertility/productive land reduce Deforestation – no material to support this business Reduce the Food Production Not have Food Security 	<ul style="list-style-type: none"> Affected by the Legislation for Deforestation/Afforestation proposal – if this is implemented can limit the Charcoal Business or can even encourage it. This proposal can work in a short-term but in a long-term affects the Food Security in a negative way
Livestock Business (B)	<ul style="list-style-type: none"> Cash Piecework Feed/Water/Good Care/Disease Prevention/Breeding Transportation Available Food 	<ul style="list-style-type: none"> Earn Cash Inputs – manure and oxen Start reproducing livestock (breeding) Achieve Food Security 	<ul style="list-style-type: none"> Earn Cash Inputs – manure and oxen Breeding 	<ul style="list-style-type: none"> Earn Cash Inputs – manure and oxen Breeding 	<ul style="list-style-type: none"> It is necessary to avoid Abusive Sales in order to maintain this proposal active Affected by two policy proposals: Piecework and Loan, both in order to earn cash to start this policy proposal
Groundnuts Business (C)	<ul style="list-style-type: none"> Groundnuts seeds 	<ul style="list-style-type: none"> Contributes for Inputs Available Food Achieve Food Security 	<ul style="list-style-type: none"> Increases Health Contributes for Inputs Available Food Food Security Earn Cash Buy Livestock 	<ul style="list-style-type: none"> Increases Health Contributes for Inputs Available Food Food Security Earn Cash Pay Personal Expenses Buy Livestock 	<ul style="list-style-type: none"> This proposal can contribute to the Land (Productive Land) proposal with the groundnuts' nutrients as inputs It is possible to star the Livestock Business in a long term

Policy proposals	Cause-effect pathways traced with the causal loop diagrams				
	Stage 1 Entry points for implementation	Stage 2 Short-term causal effects (less than 1 year)	Stage 3 Mid-term causal effects (between 1 and 5 years)	Stage 4 Long term ultimate ends (more than 5 years)	Complementarity between policy proposals, system risks, uncertainties, side-effects and additional comments
Gardening (D)	<ul style="list-style-type: none"> Garden inputs Rain/Water 	<ul style="list-style-type: none"> Available Food Achieve Food Security 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Since the scenario has poor rainfall and the Garden depends on water, the participants did not further develop this policy This proposal could work together with the Retention Basins/Drilling Boreholes
Loan (E)	<ul style="list-style-type: none"> Loan – OSAWA or AGORA 	<ul style="list-style-type: none"> Cash Buy Inputs Buy Livestock Achieve Food Security 	<ul style="list-style-type: none"> Debt payback Increase the food production Food Security Earn cash Start to build houses 	<ul style="list-style-type: none"> Rental Business Earn Cash 	<ul style="list-style-type: none"> It is not easy to get a loan It is important to avoid debts, if this fails, all the system cannot work properly
Piecework (F)	<ul style="list-style-type: none"> Cash to buy piecework Ability to piecework 	<ul style="list-style-type: none"> Earn Cash Earn Livestock Achieve Food Security Destroy Land Owned/Rented Land fertility/productive land reduce 	<ul style="list-style-type: none"> Start a new commerce Earn Cash Deforestation Destroy Land Owned/Rented Land fertility/productive land reduce 	<ul style="list-style-type: none"> Rain issues Land fertility/productive land reduce 	<ul style="list-style-type: none"> Ox-carts piecework: Similar to Charcoal Business, this proposal should be affected by Legislation for Deforestation/Afforestation; and this proposal can work in a short term but not in a long-term due to the rain issues – piecework destroys the land and the forestation If a person works in other's field, this can lead to the abandonment of their own lands
Land (productive land) (G)	<ul style="list-style-type: none"> Crop Rotation Crop Diversity Conservation Farming Liming Manure from livestock Manure from trees 	<ul style="list-style-type: none"> Improve land productivity Produced Food Security 	<ul style="list-style-type: none"> Improve land productivity Produced Food Achieve Food Security 	<ul style="list-style-type: none"> Improve land productivity Produced Food Food Security 	<ul style="list-style-type: none"> This proposal does not affect any of the other policy proposals in a negative way and can be always used

Policy proposals	Cause-effect pathways traced with the causal loop diagrams				
	Stage 1 Entry points for implementation	Stage 2 Short-term causal effects (less than 1 year)	Stage 3 Mid-term causal effects (between 1 and 5 years)	Stage 4 Long term ultimate ends (more than 5 years)	Complementarity between policy proposals, system risks, uncertainties, side-effects and additional comments
Rental Business (H)	<ul style="list-style-type: none"> Cash Place to build Construction materials Brick layer 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Increase the Cash due to Rental Business Buy Livestock Buy Inputs Achieve Food Security 	<ul style="list-style-type: none"> The process of building a house takes 7 years It is possible to start this business from other business-like Livestock or Loan
Partnership (I)	<ul style="list-style-type: none"> Partner 	<ul style="list-style-type: none"> Increase/decrease the Produced Food Earning/loosing Cash Achieve Food Security 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> This proposal has 2 situations: can be positive or negative depending on how committed are the partners
Legislation for Deforestation/ Afforestation (J)	<ul style="list-style-type: none"> Rules 	<ul style="list-style-type: none"> Increase the number of Trees Decrease/Increase the Charcoal Business Increase land fertility (manure) 	<ul style="list-style-type: none"> Increase the number of Trees Improve the land fertility (manure) Improve the rainfall pattern Fruits from trees Earn Cash Achieve Food Security 	<ul style="list-style-type: none"> Increase the number of Trees Improve the land fertility due to the manure of trees Fruits from trees Improve the rainfall pattern Earn Cash Food Security 	<ul style="list-style-type: none"> This proposal can affect the Charcoal Business and the in a negative way Legislation for deforestation can discretely motivate the Charcoal Business
Retention Basins/ Drilling Boreholes (K)	<ul style="list-style-type: none"> Cash to buy the materials Material to drill the borehole and to dig the retention basins 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Water available Achieve Food Security 	<ul style="list-style-type: none"> Water available Food Security 	<ul style="list-style-type: none"> This proposal is expensive to concretize Since their area has very poor rainfall pattern, the retention basins could be useless

4.4.6. Action Plan Outline

Based on all the results above, a “vertical” Action Plan was built. The action plan outline intends to describe the pathways during a proposal implementation, and its consequences, in a short, medium and long-term to achieve food security in a scenario with “no government help and poor rainfall pattern”. Similar to the outline of the policy proposals pathway (Table 4.5), the short-term means less than one year, the medium-term represents the time from one year to five, while long-term is more than five years. In addition, it should be noted that this action plan was not implemented during the workshop, so it symbolizes an interpretation of the workshop outcomes and researched information and can be always adapted and changed depending on the circumstances. Moreover, the action plan does not respect to a strict scale, and the time allocated to each causal path is indicative, based on analysis of workshop results.

The Vertical Action Plan has green, orange and red arrows, variables names in black and a blue stripe. The green arrows represent the reinforcing/positivity of the influence from one variable to the other; the orange links characterize the possibility of a positive or negative influence by the previous variable to the other and can be just found in the Partnership proposal; finally, the red arrows show the negative/balancing effect between the variables. The blue stripe, which is always on the top of *Food* variable, mean the Food Security was achieved since they have food available or access to food. However, each proposal will be explained in this section.

The Piecework proposal is the first one to achieve Food Security, according to this action plan. As was said previously, piecework can be many activities, from working in others’ land, or selling ox-carts, or even starting a new trade (commerce). However, if a person works directly as an employee receives money or livestock as a payment, so she/he has the access to buy food. There are other negative consequences though, such as their own land can be harmed because the pieceworker is not taking care of it-

Charcoal and Livestock Business can achieve Food Security relatively at the same moment, still in the short-term. Both depend on sales of their products to earn cash, so after they can buy food for their own consumption, or even other things/products, such as inputs, livestock, personal expenses. The Charcoal Business shows how harmful it is in a short-term for land, because of the ashes, and for health like breathing problems, that can increase in a medium-term for something more serious – asthma, tuberculosis, among others. The same business depends on trees, so with the deforestation felt in a short-term, this can affect the rainfall in a medium- and long-term.

Gardening was a proposal that was refuted shortly after it was created due to the extreme necessity of water. However, if there is a Retention Basin or a Drilling Borehole providing water, this policy would reach food security in a short-term. To cultivate a gardening with vegetables, like sweet potato takes one to three months to grow and to be ready for consumption: the main sweet potato growing period is from October to December with harvesting in January. A second crop can be established in December and harvested in April. This allows farmers to double crop in one season (Bukania, n.d.).

Similar to the previous one, Groundnuts Business, is also relatively fast to grow food, from varieties starting from 90 days, such as comet, to 160 days, for example, chalimbana (Ross & Klerk, 2012). The ingestion of this type of food brings benefits to health and also to the land, due to the high nutrition levels. The groundnuts can be also sold in order to earn money.

Partnership is the only dubious proposal because it depends on the commitment of the partner. So, this partnership can work and achieve food security in a short-term, with the cultivation of the fields; or cannot work and do not harvest anything, which difficult the achievement of food security.

The Loan proposal is one of the riskiest ones because the person needs to ask for a credit and find a way to payback with all the interest and corrections (debt payback). So, for this proposal, the person must invest in other policies – on land, livestock or even rental business. For example, the person could buy inputs in order to improve the land fertility and cultivate food for consumption, thus achieving Food Security.

The Legislation for Deforestation/Afforestation aims to protect and to improve the number of trees. Because of this proposal, the Charcoal Business cannot work anymore, since it is limited by the trees. The trees provide inputs, because of their leaves manure, and also helps with the rainfall patterns – growing trees take water from the soil and release it into the atmosphere. Tree leaves also act as interceptors, catching falling rain, which then evaporates causing rain precipitation elsewhere — a process known as evapotranspiration (Evans, 2012). The trees not only improve the soil fertility and rainfall pattern but also provides fruits – mango, avocado, guava, among others, accomplishing food security in a medium-term.

The Land (productive land) proposal aims to increase the soil fertility without the need of artificial fertilizers provided by FISP. So, there are many activities that can be implemented: Conservation Farming, Liming, natural Inputs from manure and recycled seeds, Crop Diversity and Crop Rotation. The Crop Rotation is practised between seasons, which is the activity that takes longer. This is the reason why in this policy the food security is just accomplished in a medium-term. If the food production is enough for sales business, the food surplus can be sold in order to earn cash.

Retention Basins and Drilling Boreholes are very expensive policy proposals – The price of a completed borehole in Zambia tends to be in the range of \$4,000 to \$5,000 although it can be double for some donor-aided projects – which would take a long time to dig and to drill these water captions (Armstrong, 2009). In case of the Drilling Boreholes the water should be available soon, on the other hand, Retention Basins depends on the rainfall to be filled up. After having the water available, it goes to land, together with inputs, and can produce food, achieving food security in the medium-term.

Lastly, the Rental Business is the one which takes longer to accomplish food security, but at the same time, it can be considered the most stable business. According to the transcripts, to build a house takes around seven years, so this proposal could just start in a long-term. After finding all the inputs needed

for the construction, the house could be built and rented. With that rental money, the person could buy food, or even start other business or invest the money in their own land. In this case, the food security would be just achieved in a long-term. Figure 4.31 represents the Vertical Action Plan.

4.5. Follow-up Actions and Implementation Evaluation

After the scenario workshop, there were three follow-up questionnaires/interviews. The first one was in May, the second in June, and the third and last one in November of 2016. The compilation of all the follow-up activities is in Appendix 5. The third follow-up has also the transcription in Appendix 4. Table 4.6 summarizes all the actions taken, related to each proposal mentioned before, during the semester subsequent to the scenario workshop.

Table 4.6 Follow-up actions during the semester following the workshop

Participants and workshop A/B	A	B	C	D	E	F	G	H	I	J	K	Way forward
P01 (A)		✓			✓							B, G, H
P02 (A)		✓	✓	✓			✓					B, C, G
P03 (A)	✓	✓		✓								A, C, G
P04 (A)		✓					✓					A, B, G
P05 (A)	✓	✓	✓				✓					A, B, G
P06 (A)	✓	✓	✓	✓			✓					A, D, G
P07 (A)		✓					✓					G
P08 (A)		✓	✓				✓					B, G
P09 (A)		✓					✓					B, G
P10 (A)		✓		✓								B, D, G
P11 (A)		✓										B, D, G
P14 (B)		✓	✓				✓					B, G
P15 (B)		✓	✓				✓	✓				B, C, G
P16 (B)		✓										B, D, G
P17 (B)		✓					✓					B, E, G, H
P18 (B)						✓						B, G
P19 (B)		✓										A, B, G
P20 (B)		✓					✓					B, G
P21 (B)		✓		✓			✓					B, D, G
P22 (B)		✓					✓	✓				B, G, H

Twenty participants returned the follow-ups (80%). The participants P12 and P13, from workshop A and P23, P24 and P25, from workshop B, did not take part of the follow-up questionnaire and interviews, so they are not included in this table either the Appendix 5.

The table shows that almost all the participants did something related to improving the Livestock Business (B), and also want to do so in the future. These actions might be disease prevention, buying/selling livestock, good care, among others. Another proposal that was cited several times was the Land (productive land) (G) since participants were finding solutions to improve soil fertility, such as buying inputs, using manure, practising crop rotation. Many participants practised Gardening (D) and Groundnuts (C) business in order to ensure food security and/or to find income when selling the crops. Three participants from workshop A assumed that they practised Charcoal Business (A) and wanted to continue doing it, in order to increase their income. Participant P01 revealed she joined OSAWA to get a Loan (E), so she could have money to buy iron sheets for her house construction. Some of the participants hired piecework from others, for instance P06, or stated a desire to hire, such as P01 and P20, while P18 did Piecework (F) to earn money. Lastly, P15 and P22 were building houses, which can

be used in the Rental business (H). Partnership (I), Legislation for Deforestation/Afforestation (J) and Retention Basins/Drilling Boreholes (K) were not considered by the participants during the follow-up evaluation.

On the other hand, other policy proposals, which were not explored as policies in the scenario workshop, were taken into account: planning to save money into bank account (P05, P09, P10, P20); lending money for others with regard to earning more money considering the interest rates (P06); and starting a business/commerce, for instance selling salt, fritters, cooking oil cabbage, open a bar, or build a shop (P06, P07, P08, P16, P17, P19).

It is important to mention that maize and other typical food business was also considered by the participants, however, the follow-up mainly focused on the more alternative policy proposals. Moreover, since the follow-ups focused more on the 'Livestock', 'Cash', 'Food Security' and 'Land' topics, the policy proposals which were not directly related to them were not mentioned.

Overall, the results of the follow-up stage were very positive. In a general way, all the participants showed continuous improvements and focus on a goal and particular actions, which indicates that the workshop was effective and apparently, all the participants could ensure food security at home. Interestingly, the most part of the participants affirmed they were busy harvesting during the second follow-up, in June, so they could not improve their actions. Below, there are some examples of the follow-up assessment.

P05 is an example of a significant evolution from each follow-up to another (Table 4.7). Relatively to livestock, even though in the first follow-up there were no actions taken, from the first to the third one was possible to increase the number of livestock. Cash, from the first to the second, the participant did what she planned – saved money through the bank. In the first follow-up this participant wanted to find a way to improve the amount of food, and after one month, she bought Groundnuts also for selling. Finally, the participant did not take any action related to the land, but after it was possible to improve Land fertility with manure which was one of her previous plans.

The participant P06 was the person who applied more actions to the policy proposals and coincidentally, she was the woman who added more ideas to the policy proposals during her workshop (A). Contrary to P16, which was also the woman who participate more in the policy proposals building, who just invested on the livestock proposal, nevertheless P16 was very constant with her actions along the follow-up surveys. Participant P09 was the one who contributed more to the policies elicitation stage, but he just invested in livestock and land, similarly to P22 in the workshop B. However, this last participant managed to start building his house.

Table 4.7 Follow-up actions taken by P05

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
P05 (A)	Livestock	1 st	• N/A	• Busy harvesting	• Buy livestock after harvesting
		2 nd	• Bought goat and chickens – livestock	• Increase the number of livestock	• Buy a cow
		3 rd	• Bought chickens – livestock (P05-55, p.4)	-	-
	Cash	1 st	• Charcoal business	• Pay personal expenses – school	• Planning to save money through the bank (savings)
		2 nd	• Took the money from the bank (savings)	• Pay personal expenses - school	• Charcoal Business
		3 rd	-	-	-
	Food Security	1 st	• Had food for household consumption and for selling	• To avoid hunger	• Find alternatives to improve the amount of food
		2 nd	• Proper storage of maize • Bought groundnuts	• To avoid pests • Sell the groundnuts – groundnuts business	• Store maize to sell after
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Apply manure after harvesting
		2 nd	• Bought groundnuts seed	• Groundnuts do not require manure	• Waiting for the rain season so that she plants the groundnuts
		3 rd	• Bought groundnuts seed (P03-61 p.4) • Gardening (P03-64 p.5)	-	-

The stakeholder P18 can be considered the one which is in the worst situation (Table 4.8). This participant did not invest in livestock because of cash issues, and in the first follow-up, she does not know what she could do next. Even so, in the second follow-up, she knew that her target was to buy livestock. In order to earn cash, this participant did piecework, but at least at the time of the first follow-up she was still waiting to get paid. When it comes to food security, it seems that she managed to achieve it, through receiving maize as piecework payment. Lastly, there were no actions taken related to land because she was still harvesting (first follow-up) and she did not have the access to manure (second follow-up). This participant did not attend the last follow-up.

Table 4.8 Follow-up actions taken by P18

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
P18 (B)	Livestock	1 st	• N/A	• She does not have livestock	• She does not know
		2 nd	• N/A	• Lack of money to buy livestock/medicine	• Buy chickens (livestock)
		3 rd	-	-	-
	Cash	1 st	• N/A	• Still waiting to be paid by the people she worked for (piecework)	• She will wait to be paid so she can spend the money
		2 nd	• Sold grass	• Pay personal expenses	• Continue selling grass
		3 rd	-	-	-
	Food Security	1 st	• Receiving maize as a piecework payment	• Increase the available food	• Keep cultivating
		2 nd	• Proper storage	• Increase the available food time	• Take good care of food – avoid carelessness and proper storage
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Crop rotation
		2 nd	• N/A	• She did not have where to find manure	• Buy fertilizer
		3 rd	-	-	-

Finally, comparing the Vertical Action Plan (Figure 4.31) to the Follow-ups action (Table 4.6) it is possible to note that participants chose, mostly, actions related to policy proposals which achieve food security in a short-term – piecework, charcoal business, livestock business, gardening, groundnuts and loan. And they were already investing in policy proposals that assure food security in a medium- and long-term – land (productive land) and rental business. In this case, it is possible to affirm that the workshop and the implementation of the action plan were successful and the participants increased their knowledge, putting it into practice. Additionally, the income classification or level of education of the participants do not seem to pose a limitation for the most part of them.

5. Conclusions

5.1. Key Lessons Learned

Ensuring food security is an urgent task. Still, in the current times, many countries and regions live below what is called food security – their population does not have access, availability and benefit of food; while resulting in hunger, undernourishment, poverty, social inequalities, among other harms. The reason is that farming systems are complex and dynamic, involving several interactions between stakeholders, economic factors and biophysical phenomena, including climate change.

Increasing food security and adapting to climate change is a dynamic decision-making task that involves a wide range of stakeholders such as farmers, the private sector, consumers, civil society, and policy-makers (Saldarriaga et al., 2014). In this thesis, it was possible to work with one particular stakeholder group of smallholder farmers from Chibombo district, in Zambia, who struggles to achieve food security and to help make future plans in order to have food security during all year, by combining a scenario workshop with participatory SD modelling. The Scenario Workshop was a starting point to provide them with a possible vision of the future and tools to think in a medium- and long-term, so they could find policies to help them achieve food security and their outcomes. According to the researchers, this group did not have visioning and planning skills, especially in a medium- and long-term: *“That’s what makes us fail because of wanting to do everything in a short period of time and you even fail to do even one thing because of wanting to do everything in a short time (...) Because us sometimes we don’t have even a goal that’s why we just say in a year if I see someone driving a vehicle then I will also think of buying a vehicle and tomorrow (...)”*, (P10-1509 p. 157, Appendix 2). The participatory SD modelling, more precisely, a participatory systems mapping approach, was applied to build pathways for each policy proposal identified by participants, and the CLDs resulting from the proposals were analysed in order to build an action plan.

This was a long and time spending research, since the beginning until the follow-up is covered by this thesis, concerning many methods and some adaptations of them. The Scenario Workshop was adapted due the restricted time and science-based knowledge of the stakeholders. Therefore, the interviewers found it easier to present just one scenario, instead of the four possible scenarios created previously, moving away from the essence of choosing the desirable one. This scenario represented the worst events they could face: a reduced rainfall pattern and do not get government help with the inputs. This vision was chosen to prepare the smallholder farmers in case of this happens, stimulating them to find strategies/policies to avoid and overcome these issues. Nowadays, they are already facing problems with the rainfall due to climate change and struggling to receive their inputs subsidy and the prices are increasing: *“(...) some vouchers did not come out”* (P15-676 p.184, Appendix 3); *“I just received 2 bags instead of 4. Isn’t that what we call tough? Because in the past we used to get fertilizer early as long as*

the money goes to the bank and you will get your fertilizer, but now life is becoming tough, even I have not received my fertilizer” (P07-676 p. 136, Appendix 2).

More related to the data collection, some parts of the translated transcriptions were slightly imperceptible, as well as the audio recording, which may lead to the exclusion of some information. When it comes to the coding method, it is possible that the coder’s interpretation may not accurately capture the true meaning of the speech and the modeller’s interpretation can affect the nature of the final CLD when blending multiple mental models of the participants. On the other hand, and according to Kim & Andersen (2012), coding process will reduce the modeller’s subjective influences on the causal structures and it is likely that other modeller might reproduce the same results.

The participatory mapping and coding method allowed to build CLD mapping out the feedback loops, which facilitates the identification of the leverage points. The leverage points found in the Lessons Learned exercise were from two types which inform and control parts of the system, which can have a large effect on the system behaviour, and one that influences the physical part of the system. Continuing with the data processing and analysis, the cross-impact analysis method that was used to study the policy proposals is a graphical way to report the cause-effect of them, however, it does not show if a proposal affects negatively or positive the other, which could be a valuable information for the decision-makers.

This study represents how scenario tools and SD complement one another and that both techniques allowed the smallholder farmers to focus on the sustainability of the food system. These two approaches share some characteristics, for instance, both acknowledge the dynamic and unpredictable nature of the future in a complex system and they boost system thinking and the gain of knowledge. The scenario workshop is disruptive because it gives the opportunity for stakeholders to create images and possible futures. Nevertheless, the case study did not explore the quantitative analysis of scenarios, which could be supported through the subsequent development of a SD model and its simulation. This last would help stakeholders in the decision-making process in a more objective-oriented way.

Overall, the Scenario Workshop outcomes were very positive. The participants could remember a large part of the CLD from the previous workshop (ST workshop 2015), adding more variables and links, which made the CLD closer to their reality. Moreover, the smallholder farmers could recap and analyse the dynamic complexity of the system, through the water glasses exercise (Figure 4.10 Scenario Workshop – Glasses of Water activity (Revision of the workshop 2015)). Furthermore, the participants reported their feedback from the first workshop, expressing what they could manage to do and their difficulties, such as saving money, improving land practices, buy livestock, among others. After introducing the vision ‘no rainfall, no government help’, the participants did a brainstorming to come up with 11 final policy proposals and their pathways to ensure food security and quality of life. Some other suggestions were done but were refuted during the dialogue, such as *“if you used to eat 4 times a day then you must change and start eating 2 times a day”* (P08-930 p. 142, Appendix 2).

The policy proposals were original and could be applied in their real life. These included strengthening policies, already identified before – charcoal business, livestock business, groundnuts business, gardening, loan, piecework, and land (productive land); and new policies added to the CLD – rental business, partnership, legislation for deforestation/afforestation and retention basins/drilling boreholes. After analysing the behaviour of the policies between them, none was considered critical to the system; while groundnuts business, piecework, retention basins/drilling boreholes and partnership were buffering; livestock business and land (productive land) were contemplated as reactive; and the remaining, active. A large part of the policy proposals focused on “how to increase the cash”, instead of looking for food security; nevertheless, it is possible to say that food security is implicit in money oriented-policies, i.e., when a smallholder earns money, he/she can buy food or inputs to increase the land fertility and capacity.

From the policy proposals and their outline of their pathways, an action plan was built in order to illustrate how each proposal could reach food security. Piecework was considered to be the fastest (short-term), whereas rental business was the slowest (long-term), since building a house from the beginning take seven years to be ready, according to the participants. Besides, this action plan is not static and can be modified depending on the underlying data. According to the follow-up questionnaires, the action plan was confirmed. The follow-up showed that some participants were already following the pathways and after a semester they were ensuring household food security, doing business, and even started building houses; additionally, the followed pathways were mostly from the short-term policies. The comparison between the follow-up and the action plan shows how consistent the policy proposals are and can be adapted individually. Hence, it is possible to affirm that thanks to the scenario workshop the smallholder farmers present a significant degree of convergence on systemic issues. Lastly, during the transcription of the last follow-up (Appendix 4), the interviewer mentions that the stakeholders who were present in the workshop and tracked their actions through the booklet that was distributed were achieving better the goals. On the other hand, the increase of productivity can stimulate interest by local government to consider taxing the farmers.

5.2. Future research/developments

The feasibility and consistency, or inconsistency of the outcome policies could be also measured quantitatively in a SD model, using the tool *Vensim*. The model could be developed from the last CLD (Figure 4.29), adding quantitative values and equations. Moreover, the original Scenario Workshop script could be applied, since the smallholder farmers are already familiar with it. The Scenario Workshop could be done in two days, as it is suggested by Kallis et al. (2009), so all the steps could be done with the stakeholders, including the development of the action plan; and involve stakeholders from other categories, for instance government and private sector, in order to optimize and increase the brainstorming, knowledge and awareness of different levels. Finally, following the participant's actions in a long-term to compare if their plans are proceeding according to this research, would allow measuring the impact of the proposed approach at the local level of the case study in Zambia.

6. References

- Alcamo, J. (2001). *Scenarios as tools for international environmental assessments. Environmental issue report*. Copenhagen: European Environment Agency. Retrieved from http://www.eea.europa.eu/publications/environmental_issue_report_2001_24/issue_report_no_24.pdf
- Armstrong, T. (2009). Code of Practice for Cost-Effective Boreholes Zambia: Country Status – July 2009, (November).
- Backcast Partners. (n.d.). What is Backcasting.
- Brunner, S. H., Huber, R., & Grêt-Regamey, A. (2016). A backcasting approach for matching regional ecosystem services supply and demand. <https://doi.org/10.1016/j.envsoft.2015.10.018>
- Bukania, C. (n.d.). Growing sweetpotatoes in the desert: what this could mean for food security in sub-Saharan Africa?
- Cammelbeeck, S. (2015). WFP Zambia Country Brief, (December), 2. Retrieved from <http://www.wfp.org/countries/zambia/>
- Coleman-jensen, A., Gregory, C., & Singh, A. (2014). *Household Food Security in the United States in 2013*.
- CSO. (2015). *2015 LIVING CONDITIONS MONITORING SURVEY REPORT 2015 LIVING CONDITIONS MONITORING SURVEY (LCMS)*.
- Evans, K. (2012). Make it rain: Planting forests could help drought-stricken regions.
- Faggiolani, C. (2011). Perceived Identity: Applying Grounded Theory In Libraries, 2, 1–33. <https://doi.org/10.4403/jlis.it-4592>
- FAO. (2006). Food Security, (2), 1–4.
- FAO. (2014). *The State of Food Insecurity in the World: Strengthening the enabling environment for food security and nutrition*.
- FAO. (2016). *THE STATE OF FOOD AND AGRICULTURE*.
- Featherston, C. R., & Doolan, M. (2005). Using System Dynamics to Inform Scenario Planning : A Case Study.
- Food and Agricultural Organization. (2012). Smallholders and Family Farmers.
- Food and Agriculture Organization. (1996). World Food Summit: Rome Declaration on World Food Security and World Food Summit Plan of Action. *World Food Summit*, 1–32. <https://doi.org/10.2307/2137827>
- Food Security Information Network. (2017). *Global Report on Food Crisis*.
- Giraldo, D. P., Betancur, M. J., & Arango, S. (2008). Food Security in Development Countries: A systemic perspective, 1–15.
- Glaas, E., Neset, T. S., Kjellström, E., & Almås, A. J. (2015). Increasing house owners adaptive capacity: Compliance between climate change risks and adaptation guidelines in Scandinavia. *Urban Climate*, 14, 41–51. <https://doi.org/10.1016/j.uclim.2015.07.003>
- Gold, B. (1974). *From backcasting towards forecasting* (Vol. 2). [https://doi.org/10.1016/0305-0483\(74\)90090-5](https://doi.org/10.1016/0305-0483(74)90090-5)
- Gregory, P. J., Ingram, J. S. I., & Brklacich, M. (2005). Climate change and food security, (October), 2139–2148. <https://doi.org/10.1098/rstb.2005.1745>
- Guma, I. P., Rwashana, A. S., & Oyo, B. (2016). Household Food Security Policy Analysis: A System Dynamics Perspective. *International Journal of Scientific & Tecnology Research*, 5(July).
- Hager, G., Kopainsky, B., & Nyanga, P. (2015). Learning as conceptual change during community based group interventions. A case study with smallholder farmers in Zambia, (Paper presented at the 33th International Conference of The System Dynamics Society), 1–19.
- Hojer, M., & Mattsson, L.-G. (2000). Determinism and backcasting in future studies. *Futures* 32, 32, 613–634.
- IFRCRCs. (2006). *How to conduct a food security A step-by-step guide for*.
- Kallis, G., Hatzilacou, D., Mexa, A., Coccossis, H., & Svoronou, E. (2009). Beyond the manual: Practicing deliberative visioning in a Greek island. *Ecological Economics*, 68(4), 979–989. <https://doi.org/10.1016/j.ecolecon.2007.07.002>
- Kanter, D. R., Schwoob, M., Baethgen, W. E., Bervejillo, J. E., Carriquiry, M., Dobermann, A., ... Lima, S. De. (2016). Translating the Sustainable Development Goals into action : A participatory backcasting approach for developing national agricultural transformation pathways. *Global Food Security*, 10, 71–79. <https://doi.org/10.1016/j.gfs.2016.08.002>
- Keller, S. (n.d.). Visioning. Retrieved July 3, 2017, from https://www.sswm.info/content/visioning#reference_

- Kim, H., & Andersen, D. F. (2012). Building confidence in causal maps generated from purposive text data : mapping transcripts of the Federal Reserve, 28(4), 311–328.
<https://doi.org/10.1002/sdr>
- Kok, K., Patel, M., Rothman, D. S., & Quaranta, G. (2006). Multi-scale narratives from an IA perspective : Part II . Participatory local scenario development, 38, 285–311.
<https://doi.org/10.1016/j.futures.2005.07.006>
- Lusaka Times. (2016). 40.8% of Zambians living in extreme poverty. Retrieved October 5, 2017, from <https://www.lusakatimes.com/2016/04/28/40-8-zambians-living-extreme-poverty/>
- Maetz, M. (2012). Food crises: a consequence of disastrous economic policies.
- Mapfumo, P., Adjei-nsiah, S., Mtambanengwe, F., Chikowo, R., & Giller, K. E. (2013). Participatory action research (PAR) as an entry point for supporting climate change adaptation by smallholder farmers in Africa. *Environmental Development*, 5, 6–22.
<https://doi.org/10.1016/j.envdev.2012.11.001>
- Meadows, D. (1999). Leverage Points - Places to Intervene in a System. *The Sustainability Institute*.
- Mercy Corps AgriFin Accelerate. (2017). Fertile Ground Series - A 2016 Zambia Ecosystem Review & Strategic Perspective on Digital Financial Services for Smallholder Farmers.
- Metson, S., Cordell, D., & Iwaniec, D. M. (2016). ScienceDirect P-FUTURES : towards urban food & water security through collaborative design and impact.
<https://doi.org/10.1016/j.cosust.2016.03.001>
- Monasterolo, I., Mollona, E., & Pasqualino, R. (2015). The role of System Dynamics modelling to understand food chain complexity and address challenges for sustainability policies. ... *and the Food and Agriculture ...*, 1–15. Retrieved from http://www.fao.org/fileadmin/templates/ags/docs/MUFN/CALL_FILES_EXPERT_2015/CFP3-06_Full_Paper.pdf
- Olabisi, L. K. S., Kapuscinski, A. R., Johnson, K. A., Reich, P. B., Stenquist, B., & Draeger, K. J. (2010). Using scenario visioning and participatory system dynamics modeling to investigate the future: Lessons from Minnesota 2050. *Sustainability*, 2(8), 2686–2706.
<https://doi.org/10.3390/su2082686>
- Pinstrup-Andersen, P. (2009). Food security: definition and measurement. *Springer Science + Business Media B.V. & International Society for Plant Pathology 2009*, 5–7.
<https://doi.org/10.1007/s12571-008-0002-y>
- Richardson, G. P., & Andersen, D. F. (1995). Teamwork in group model building, 11(2), 113–137.
- Robinson, J. B. (1982). Energy backcasting analysis.
- Robinson, J. B. (1988). Unlearning and Backcasting : Rethinking Some of the Questions We Ask about the Future, 338, 325–338.
- Rosegrant, M. W., & Cline, S. A. (2003). Global Food Security : Challenges and Policies. *SCIENCE*, 302. <https://doi.org/10.1126/science.1092958>
- Ross, S., & Klerk, M. De. (2012). Groundnut Value Chain and Marketing Assessment in Eastern Province , Zambia Prepared for the Conservation Farming Unit, (April).
- Saldarriaga, M., Kopainsky, B., & Alessi, S. (2013). Knowledge analysis in coupled social- - ecological systems. What do stakeholders in sub Saharan Africa know about the dynamic complexity of climate change , agriculture.
- Saldarriaga, M., Nyanga, P. H., & Kopainsky, B. (2014). Dynamic decision making in coupled social - ecological systems. Smallholder farmers' goals, resources and constraints in improving food security and adapting to climate change in Zambia.
- Stave, K. (2010). Participatory System Dynamics Modeling for Sustainable Environmental Management: Observations from Four Cases, 2762–2784. <https://doi.org/10.3390/su2092762>
- Sterman, J. D. (2000). *Systems Thinking and Modeling for a Complex World. Management* (Vol. 6). <https://doi.org/10.1108/13673270210417646>
- The Oxford Martin Programme on the Future of Food. (n.d.). What is the Food System? Retrieved September 15, 2017, from <http://www.futureoffood.ox.ac.uk/what-food-system>
- The World Bank. (2016). Urban population growth (annual %). Retrieved September 7, 2016, from <http://data.worldbank.org/indicator/SP.URB.GROW?end=2015&start=2015&view=bar&year=2006>
- United Nations Development Reports. (2015). Human Development Index (HDI). Retrieved September 7, 2016, from <http://hdr.undp.org/en/content/human-development-index-hdi>
- United Nations Development Reports. (2016). Zambia Human Development Report 2016. *United Nations Development Programme*.
- Vervoort, J. M., Thornton, P. K., Kristjanson, P., Förch, W., Ericksen, P. J., Kok, K., Jost, C. (2014). Challenges to scenario-guided adaptive action on food security under climate change. *Global*

- Environmental Change*, 28, 383–394. <https://doi.org/10.1016/j.gloenvcha.2014.03.001>
- Videira, N., Lopes, R., Antunes, P., Santos, R., & Casanova, J. L. (2012). Mapping Maritime Sustainability Issues with Stakeholder Groups. *Systems Research and Behavioral Science*, 29(6), 596–619. <https://doi.org/10.1002/sres.2141>
- Videira, N., Schneider, F., Sekulova, F., & Kallis, G. (2014). Improving understanding on degrowth pathways: An exploratory study using collaborative causal models. *Futures*, 55, 58–77. <https://doi.org/10.1016/j.futures.2013.11.001>
- Voros, J. (2006). Introducing a classification framework for prospective methods, 43–53. <https://doi.org/10.1108/14636680610656174>
- Wiek, A., & Iwaniec, D. (2013). Quality criteria for visions and visioning in sustainability science. <https://doi.org/10.1007/s11625-013-0208-6>
- World Food Programme. (2015). 10 Facts about hunger in Zambia.
- World Food Programme. (2016). Zambia - Current issues and what the World Food Programme is doing. Retrieved September 7, 2016, from <https://www.wfp.org/countries/zambia>
- Zambia Invest. (n.d.). Zambia Agriculture Statistics. Retrieved October 5, 2017, from <http://www.zambiainvest.com/agriculture>
- Zurek, M. B., & Henrichs, T. (2007). Linking scenarios across geographical scales in international environmental assessments. *Technological Forecasting and Social Change*, 74(8), 1282–1295. <https://doi.org/10.1016/j.techfore.2006.11.005>

Appendix 1. Scenario workshop 2016 script

Scenario workshop April 2016 – Chibombo district

Participants: 20-25 smallholder farmers from Chitumbo and Mpikwa

Workshop period: 4 hours (approximately)

Expectations for coming workshop:

Expectations formulated by farmers:

- Involve men and women;
- Knowledge acquisition, for example budgeting, water management
- Planning
- Co-operation, working together

Enumerators' ideas

- Manage expectations: farmers are used to getting something tangible, such as seed that they can plant on a demonstration plot and show during a next visit
- How to deal with uncertainty? E.g. early vs. late onset of rains, early vs. late onset of dry period → teach how to spread the risk
- Gender and decision making → involve spouses

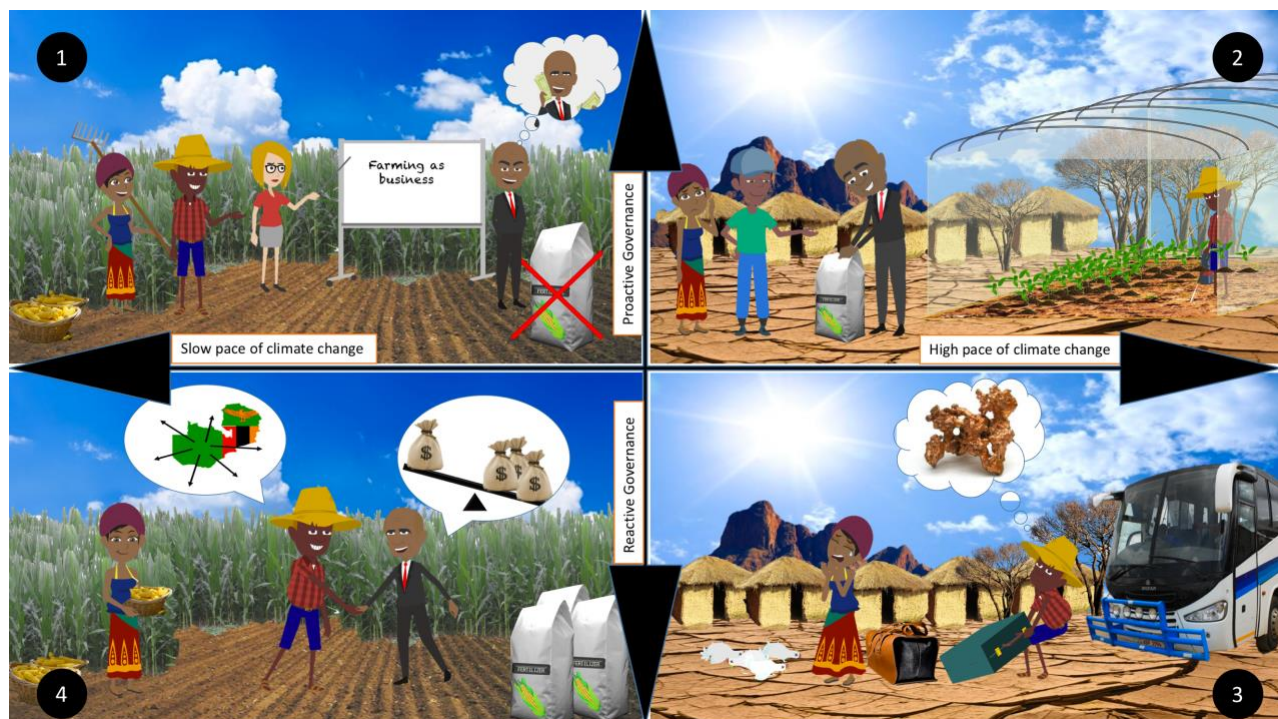
Activities:

1. Lessons Learned by the participants – reminding the glasses of water activity
2. Ask the key questions:
 - a. What to do with cash?
 - b. How to increase/decrease cash?
 - c. How to get food?
 - d. How to improve land fertility/farming?
 - e. How increase livestock?
3. Feedback from participants – what they manage to do after the previous workshop/difficulties/failures
4. Leading question: "Where would you like to see you in 15 years to be food secure and protected from climate change?"
5. Explanation about the 4 scenarios
6. Discussion about the scenarios
7. Each participant chooses his desirable scenario (1 of the 4 scenarios) and a group for each scenario may be formed, maximum 10 participants per group. The same scenario can have more than 1 group. The groups should be heterogeneous (i.e. different farmer characteristics).
8. Formulation of their own desirable vision from a scenario – asking the participants to remove, replace or add elements from all the 4 scenarios (respecting the axes)
9. Each group has to find ideas to achieve their own vision in a back-casting method: they imagine themselves in the scenario that they choose ("future") and come back to their actual situation ("present"). They should answer "What should I do in the present to achieve that vision?".
10. Each group votes for their 5 best ideas and turn it to a draft *Action Plan*

11. Each group introduces their *Action Plan* to the rest of the participants and discusses their ideas, vulnerability and feasibility, scoring them from the most to the less vulnerable (optional); trying to find solutions to overcome them.
 - a. If the group is working in the same scenario they should blend their *Action Plan* and turn into one.
12. Distribution of the report cards for self-monitoring

Scenarios:

- Time horizon: 10 – 15 years (vision of 2030)



Scenario 1: If a child washes his hands he could eat with kings³

- Slow pace of climate change
- Proactive government

Climate change is stabilizing and the crops are growing/producing more frequently so the agriculture is more resilient now. The government continuous to buy maize from higher price than the marked price and develop some programs to help farmers develop their lands in a sustainable way, like projects to teach them to organise their selves and also teach “farming as business”. In the other hand, they reduce the

³ If you prepare and allow yourself to be well trained when you have the opportunity, you will achieve a lot and be favoured in due course (Source: <http://answersafrica.com/african-proverbs-meanings.html>)

fertilizer subsidies in order to save money for the programs and projects. Also, it is possible to find some corruption from the authorities.

Scenario 2: *Knowledge is like a garden: if it is not cultivated, it cannot be harvested*⁴

- High pace of climate change
- Proactive government

The temperature and rainfall changed very fast, the maize crops did not have the time to adapt/try to adapt to a new atmosphere. The government realised about it before so it was preparing the farmers to new situations – it helped moving fields away from river banks, also encourage the diversification of the crops, for example. Some programs were developed to help the farmers find ways to reduce the impacts of climate change and also provided them new agricultural machines, techniques and technologies – NAPA (National Adaptation Programme of Action) developed and implemented more projects related to small holder farmers. The government benefits food security but at the same time the stakeholders need to know that the innovations could not work and to struggle with corruption, and also the better-off farmers were benefited first.

Scenario 3: *The best way to eat an elephant in your path is cut him up into little pieces*⁵

- High pace of climate change
- Reactive governance

Because of the climate change the weather changed a lot: droughts, storms, floods and cold snaps are the reason why the crops are producing less maize and the livestock is not healthy anymore. The government is helping the farmers with their problems, trying to compensate them first with the improvement of the warehouse system so they can save food in a better way; second with other jobs opportunities (like in copper holdings) in other villages/cities of Zambia, for exchange the government has the rights of their crops.

Scenario 4: *A man who pays respect to the great paves the way for his own greatness*⁶

- Slow pace of climate change
- Reactive governance

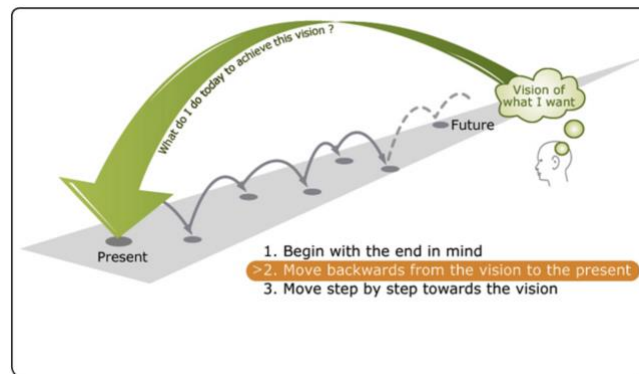
Minimal climate change has positive impacts on food security in Zambia, the government tries to export their products to external markets around – growing markets (regional markets: Congo, Angola, Zimbabwe) but the government gets most of the profits. Furthermore, the government is still reactive, continuing to buy the maize from higher price than in the market and subsidizing the fertilizers. The government does not give a big importance to food security until the crises occur.

⁴ If you do not make efforts to acquire knowledge then you would not expect to have it and if you do not put the knowledge you have to use, you cannot expect to gain anything from it (Source: <http://answersafrica.com/african-proverbs-meanings.html>)

⁵ The best approach to solving a problem is to take bit by bit; one at a time (Source: <http://answersafrica.com/african-proverbs-meanings.html>)

⁶ What goes around, comes around so whatever you sow, you shall reap (Source: <http://answersafrica.com/african-proverbs-meanings.html>)

Back-casting method:



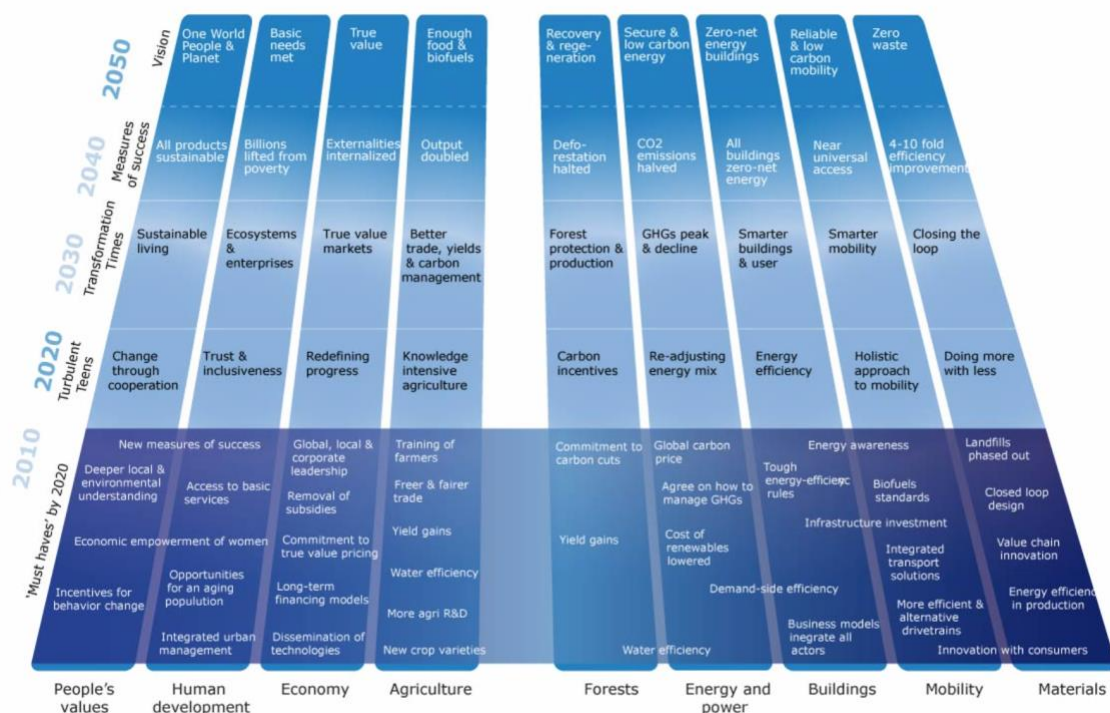
(Source: <http://www.naturalstep.ca/backcasting>)

Examples of vulnerability and proposal to overcome:

Vulnerability	Collaborative proposal
(1a) The observer's role of the East African Farmer Federation in East African Community policy means that there is not enough of a direct link between farmers' issues and priorities and decision-making	(1b) Proposal: organize processes with specific regional bodies for the East Africa Farmers Federation to have a more proactive voice in agricultural and food security policy processes
(2a) The lack of knowledge exchange between ministries within countries and between countries at the regional level in East Africa	(2b) Proposal: exchange programmes on farmer's schools associations, linked to "farms of the future" programme; on indigenous, alternative crops; rural-urban agriculture
(3a) The lack of effective collaboration between civil society, social entrepreneurs and governments on agriculture and food security	(3b) Proposal: a series of meeting to explore state/non-state partnerships and compatibilities for climate adaptation is to be organized, as well as training to build the capacity for collaboration
(4a) Vulnerability: a lack of links between Early Warning Systems for food security at the regional level, and a lack of a connection to any regional food reserve	(4b) Proposal: linking existing Early Warning Systems for food security to regional food reserve planning

(Source: M. Vervoort et al. / Global Environmental Change 28 (2014) 383–394, Table 2)

Example of an *Action Plan*:



(Source: BCSD Vision 2050)

As the time horizon is 10-15 years, the *Action Plan* can describe its activities each 5 year.

Way forward

- Booklet/report cards for self-monitoring
 - List each month
 - Enter actual value
 - Evaluate actual value: are you happy with it? Is it bad? When is it so bad that you have no choice but to do something?

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Actual value												
Evaluation												

Evaluation possibilities: 😊 happy 😐 just ok ☹️ something needs to happen

- Follow-up actions during the following months

Appendix 2. Workshop transcription A

- E01 - 1** Now, maybe let us start by knowing each other, after knowing each other we will look at the rules to follow and then we will start our program. I think you know me..... my name is **E01**, I work at the University of Zambia and she will also introduce herself. I am saying that you will introduce yourself.
- E02 - 2** Okay
- E01 - 3** I can interpret
- E02 - 4** My name is **E02**, I am very happy and honoured to be back here with you. I come from the University in Norway..... and there is still snow at the moment.
- E01 - 5** Yes, so her name is **E02** comes from Norway and she said she is very happy that we have met again and there is still snow, it is cold. So, it is luck for her to come where there is sunshine. Yeah.... yes.
- P01 - 6** Meaning we also have to mention our names?
- E01 - 7** Yes, when you finish mentioning your name, give it to the next person so that it can record..... but there is no pressing on that thing.
- P01 - 8** My name is **P01**, I am a farmer here in Mufwambe
- P02 - 9** I am **P02**..... I am a farmer here in Mufwambe.
- P03 - 10** I am Mrs. **P03**
- P04 - 11** I am Miss. **P04**, I stay in Chitumbo Village
- P05 - 12** My name is **P05**, I stay in Chisumpa village.
- P06 - 13** I am **P06**, I stay in Chisumpa Village
- P07 - 14** I am **P07**; I am a farmer in Chisumpa village.
- E01 - 15** Okay thank you
- P08 - 16** My name is **P08**, stay in Chisumpa Village
- P00 - 17** *talking in the background*
- P09 - 18** My name is **P09**, a farmer in Chisumpa village
- P10 - 19** I am **P10**, I stay in Chisumpa village.
- P11 - 20** My name is **P11**, I stay in Chisumpa village.
- E01 - 21** Okay thank you. Now let us look at what follows next, the rules to follow or that which we are supposed to follow. The first rule is that we need to be very free because..... let us be free so that we can help one another..... so that we learn even from you whatever each one has and when we put them together, I think it will help us so let us be as free as possible. That is the first rule, the second one..... we are requesting that we use the recorder whenever you want to talk and speak through it because sometimes you find that if you speak while it is far, we will think that we have heard the words you spoke but it will be found that when we start writing the information will not be there. So, it is better you get it when you want to talk and maybe if someone wants to talk he/she will be given time to talk. I don't know if it is okay?
- P00 - 22** Yes
- E01 - 23** Okay, so then the next part which follows looks at what we did or what we learnt in short. If it is at school we can say it is a revision, so let us remind each other what we learnt and when we finish reminding each other, we will look at what we have come for today so that we connect with the old and the ones for today.....so that we move at the same point. I don't know if you have heard on that one?
- P00 - 24** Yes
- E01 - 25** Okay, so I was just introducing
- E02 - 26** Okay
- E01 - 27** Yes, that will start first almost like a revision of what we learnt.
- E02 - 28** Okay
- E01 - 29** Yes, after that then we will look at the purpose for today.
- E02 - 30** Okay
- E01 - 31** Yes, yeah mmhhh where do I start from?

P0M - 32	The POW		
E01 - 33	The POW?		
P0W - 34	Nowhere ever they are prepared.		
E01 - 35	Okay, just hold it		
P02 - 36	We are scared of holding it.		
E01 - 37	So, what of what we learnt when we came with these whites, who still remembers what we did or what we were using? Have you heard the question?	E02 - 64	Okay
P00 - 38	Yes	E01 - 65	And she added that that is not what is required. Okay what else?
E01 - 39	Yes, what were we using? Now okay give her so that she can tell us.	P02 - 66	I was not there during the workshop last time.
P07 - 40	What we were using or what we discussed to say we can use?	P01 - 67	We also learnt how to take care of our families so that the cash is more.
E01 - 41	Yes, what you remember	E01 - 68	Okay
P00 - 42	Okay	P01 - 69	Yes
E01 - 43	Yes	E02 - 70	Ooh livestock.
P07 - 44	What I remember is cash	E01 - 71	Okay taking care of the family so that cash is more.
E01 - 45	Cash	P01 - 72	Yes
P07 - 46	Yes	E01 - 73	Okay what we should be doing so that the money should be increasing. Okay what of you men?
E01 - 47	Okay	P09 - 74	What we learnt?
P07 - 48	From cash, you start with capital working if it is farming or keeping livestock you start.	E01 - 75	Yes
E01 - 49	Okay anyone with an addition?	P09 - 76	We looked at cash and how this cash is used if you have it.
P04 - 50	We learnt and we were putting cups (tambulas)	E01 - 77	okay
E01 - 51	Okay tambulas meaning cups?	P09 - 78	We looked at what is to be bought because we are farmers and inputs should be bought..... and we looked at how to find inputs. We were taught how you can buy them so that you continue with your farming. After that we looked at some things and where to get cash. We learnt that the land can be used to help improve..... again, we looked at other things which can make you improve and these are cattle or livestock..... to make sure that they help you and you should also take care of them. Also, the other one we looked at is to say, 'yes you are farming' but what do you need for farming? Water, rains are needed for farming and after all these you look at what you have gained from farming and that should be food; you get food, and how do you manage that food so that it helps you.....
P04 - 52	Yes, we had put the cups and we started pouring water in those cups and they asked us what it meant if it is full, half or empty.		
E01 - 53	Okay		
P04 - 54	Yes, that's what they taught us and explained to us what it meant.		
E01 - 55	Okay, now what was the meaning of that to say if the cup is full or if it is half?		
P04 - 56	It meant that..... if the cup is full then meaning that you have found capital.		
E01 - 57	Okay		
P04 - 58	If it is half meaning that you have started going into credit		
E01 - 59	Okay		
P04 - 60	And they taught us not to go into credits		
E01 - 61	Okay		
P00 - 62	Yes		
E01 - 63	So, she is explaining that we were learning about the cups and what it meant and then I probed		

	you should manage it well so that you eat with your family and have a good living with your family. If it's selling that food, yes you can sell some and leave some for food, otherwise after that that's when we looked at the cups to say for these cups to be full, if it's your livestock, you should look at the cup for livestock to say do I have cash for these..... and also, the same money should be able to help maintain your land, to maintain your water and to maintain everything so that almost everything is full and when you find that one has gone down, it means it will affect the other ones. So, it's to make sure that you don't go down and check all the cups if they are full or check if you are improving or if you are not so that your life can be improved and see to say if cattle are still there, is food still there? So that's what all these cups stand for so that they balance your life. I think that's what I heard and that's what I learnt.	
E01 - 79	Maybe there is someone who wants to add on that side? Yes,	
P11 - 80	Yes, that one we learnt to say when you farm, you harvest and sell those crops there should be a budget, so that you tackle all the programs like the school children, you should balance the money and put some for school children, also the money for medicals if there is a child who is sick, there is also money for buying relish, for grinding mealie-meal, so we looked at all these and if you don't have hoes, you get some money and buy. If it is a plough or a goat, cow or chicken we looked at it to say sometimes there are contributions in the village and we looked at such budgets.	
E01 - 81	Okay now what of if we do this, who still remembers... but now look, you are very far, I think come closer.	
		P09 - 82 Get the stools, there are stools there.
		E01 - 83 Yes, so who can explain for us, anyone to..... because some were not here when we were doing this, yes some were not here so we want to see and someone should teach us to say..... or so that we can help each other with those who were not here. Have you heard the idea which is here?
		P00 - 84 Yes
		E01 - 85 Yes, so that we are all at the same level, so each one should explain the part which he/she remembers until everyone will.....
		P00 - 86 Finish
		E01 - 87 Yes exactly, who is going to start?
		P09 - 88 There is a thing, the recorder.
		P06 - 89 Number one
		E01 - 90 Let those behind come this side and there is a stool there or maybe.....
		E03 - 91 Maybe let uncle come here
		E01 - 92 Yes, okay
		P06 - 93 Now the picture is not in a good position
		E01 - 94 Okay we can do this
		P01 - 95 Yes, it is better to talk
		E01 - 96 Yes
		P06 - 97 So, number one; we learnt about cash
		E01 - 98 Okay
		P06 - 99 Cash is the key to everything and they all come from this
		E01 - 100 Okay
		P06 - 101 So, this cash is the one which makes us manage to find food
		E01 - 102 Okay
		P06 - 103 Through farming, through buying the same cash is the one which helps us to have livestock; cattle, goats, chickens and others. Then from the same cash it also works on water; some use water for farming and the water they use is bought like in big farms.
		E01 - 104 Okay
		P06 - 105 So, land is where we find food and also it is cash which works; maybe you will be given some land by the village headman and

if it is small you can still buy, so the same cash is used even on land. Then when it comes to this one, the same cash works for us to find these inputs like fertilizer, seed, plough, hoes and others. After you find these things, that is when now we make a budget. Food at home should be reserved and should be enough so that the family should not suffer; you reserve the food for the family and after that, the same cash from these things we said here..... there is also cash for luxury, there is cash for school children, there is cash for livestock, there is some medicine needed for livestock so that your livestock can increase and just on that one again if you see that some of your livestock are old, we get them and sell in order to buy small ones, yes that's what I can explain.

E01 - 106 Okay, anyone with some additions? Yes

P10 - 107 Just like others have said, we also learnt to say from money, we find that we are farmers and so as farmers we come to fields, now in these fields if we retain only a little there is no way that I can realize some money....

E01 - 108 Yes

P10 - 109 Such that I can save in the bank

E01 - 110 Yes

P10 - 111 Yes, so now if the production is high, it will trigger growth and improvement in these other aspects, because if I produce a lot, I can manage to reserve maize for home consumption that is food available, if again I produce a lot I can sell to FRA meaning that I will have money to take to the bank, producing a lot also means I have money and support school-going children, so I discovered that because we learnt..... what causes failure is that when we have found money, we don't concentrate on this side.....to say we produce a lot because a farmer depends on what he/she

produces and so if we invest the money in soil but the realization of profit is low, the farmer will continue going down.....and hence these cups will be going down but if the farmer is able to make sure that the cups are always full, it means that all what surrounds his or her life is going to improve, because when he/she wants to buy seed he/she buys, if it is taking the child to school, he/she will manage, if it's buying a cow, he/she will manage.

E01 - 112 Okay thank you, yes someone else to add on..... whoever has an addition.

P09 - 113 Yes, just like others have said, here we learnt what we call money..... cash..... will be able to find inputs in addition to what he has said..... the challenges that we encounter on these..... then what we looked at so that you benefit especially on the part of land, we discovered that sometimes if you over-use the land, it loses its fertility. It also needs to be taken care of that's why we learnt that we should be practicing crop rotation..... we should be planting different crops not one crop every year on the same field, it will be destroyed. It can be a challenge so we are supposed to consider that and again on the same land maybe farming goes down..... we were complaining about weeds in the fields, weeds also this grass; we should control it so that our harvest can be good, we suggested that we should be weeding; cleaning for our crops. We also looked at challenges on the part of rains, sometimes what makes us fail to do well, maybe it is a year of drought, the dry spell also takes us down but even though..... this one is not our fault, it is nature, it is from God. Even this side we looked at the times of drought, those farmers that can manage we see them

	watering their crops, otherwise..... on the livestock, we also looked at how to prevent diseases from attacking our livestock so that money can continue flowing. We discovered that there are diseases, so these diseases must also be prevented by buying medicine to prevent our livestock. On the part of food, it should also be managed well because there are pests that destroy..... we should be buying medicine to prevent or treat our food so that it can be free from pests. Then the one selling..... we should reserve enough for consumption but we should also have enough to sell so that we can be making money on our farm. Otherwise on the challenges we looked at a lot of things, like sometimes there are animal diseases, food is attacked by pests we discussed that we should be buying medicine. Then, that is when we looked at the filling of these cups, that we need to have a lot of money so that all the areas of life are well balanced so that these aspects can be supplementing each other, to say this one helps that one, this one helps that one..... it becomes a chain going around nicely so that our lives can improve. I believe that's the kind of learning that I can still remember.	
E01 - 114	Okay, maybe there is someone who wants to add.....let us add..... let us add, maybe there is something he has left out..... yes.	
P0X - 115	Aah.....	
E01 - 116	Yes	
P01 - 117	Here..... we come here on livestock. On the livestock, we learnt that if you have livestock, a lot of them but you don't have implements this side on land so that you can cultivate on your field well, you can get one maybe it is a goat; like us who rear goats and chickens, when you sell	
	these, they will give you money, when you find money..... then they give you what? Maybe they give you inputs, maybe it is a 10kg, you buy and prepare on the portion you cultivate so that you realize what? You realize food, when you harvest this food..... if you harvest a reasonable amount meaning you need to divide it. The other goes for home consumption; if it is 4 or 5 bags you sell so that you find money so that even next year you do what? You buy another one.	
E01 - 118	Mmmm okay..... aah maybe there is another one who wants to add..... did we look at.... what we are supposed to do so that the cups can be getting full..... or maybe before we can talk about that....	
E01 - 119 and E02	<i>(talking in the background.... not sure of what they were talking about)</i>	
E01 - 120	Just to repeat what you were doing..... what were you explaining? You said there was a cup for cash, right?	
P06 - 121	Cash	
E01 - 122	Then what else?	
P06 - 123	Available food	
E01 - 124	available food. Yes	
P0X - 125	Land	
E01 - 126	Land, what else?	
P0X - 127	Livestock	
E01 - 128	Livestock, okay	
P0X - 129	Inputs	
E01 - 130	Inputs, now.....	
P00 - 131	Water has been left out	
E01 - 132	Water	
P00 - 133	Yes	
E01 - 134	Okay, then our desire, how was it? Our desire on these cups, didn't we look at desires?	
P0X - 135	We did	
E01 - 136	Yes, who can explain to us?	
P09 - 137	There is the recorder	
P06 - 138	Our desire..... we looked at that the cups are supposed to be full meaning that you are improving or progressing.	
E01 - 139	Yes	

P06 - 140 If the cups are not full it means that you are retrogressing.

E01 - 141 *explaining to E02 what P0X was saying*

E01 - 142 Okay

P06 - 143 So that our desire..... we learnt that the cups must be full, it is just that things are difficult but we always try to fill our cups to the brim.

E01 - 144 *explaining to E02*

P06 - 145 We sincerely desire to have the cups filled to the brim but things are hard.

E01 - 146 *explaining*

P0X - 147 Talking in agreement to what P06 is saying.

E01 - 148 *continues explaining to E02 what P00 are saying*

P06 - 149 Because on cash again if this side you don't have food, you will finish the cash by buying food, again this side, if you have food, you cannot touch a lot on cash...

P06 - 150 *leading the P00 in agreement to the desire*

E01 - 151 Yes

P09 - 152 That is our biggest desire

and

P00

E01 - 153 In short, we can say that.....in English we can say that is the goal..... that's the desire to say.....

P00 - 154 To reach there

E01 - 155 Oho, okay now that's good. Aah we looked at these things..... are there stand-alone aspects or they are inter-connected?

P09 - 156 They are interconnected.

and

P10

E01 - 157 Yes, explain

P01 - 158 Before they explain, sometimes you can change and go this way.

E01 - 159 What?

P10 - 160 The cup is not there.

E01 - 161 Oho okay

P06 - 162 Yes, put so that it gets full

P01 - 163 Yes

P06 - 164 The food cup should be full

P01 - 165 Yes, because you have cultivated

P10 - 166 Here, we are saying it is connected because the first one will start from cash and if I have

cash, I will buy seed and after buying seed, I will go to land and plant that is the field now after harvesting. I will leave some maize for food and leaving maize for food, I get the surplus and sell like that I will even manage to buy a cow from the same money. I will manage to buy seed and it will also help me buy another cow and sometimes even taking the children to school; that's how it is connected, because if I don't cultivate or plant, I will not manage to find cash because I don't do any business; I am a farmer, but if I get that cash and buy seed and that seed will go to the field meaning there is a connection from cash to the field after the connection to the field and after the production I will have food and I will sell some of the same food, after selling I will buy a cow, after buying a cow I will even take the children to school and those are the connections which I can mention.

P08 - 167

I will contribute as well; we said these things are connected and the way they are connected is like this – if there is water and it is enough meaning I will manage to produce more food, when I produce more food, meaning I will manage to leave food for the family and I will manage to sell so that I have more cash, it is not just selling I will also use the cash on livestock if they are sick or there is something needed for them and I will manage to buy seed and plant in the field if water is there because water is there and from the field meaning I will have more cash and the same cash will be used to buy seed, medicine for livestock and have more food.

E01 - 168

Okay, then now..... okay give him the recorder.

P09 - 169

The addition is that why we say that they are connected and if the chain is broken, then budgeting is not well done and meaning you concentrate too much on

entertainment which is not close to this or maybe you decide to buy a car using cash, you find that the cup for inputs will go down, you will not be able to buy inputs and also the cup for land will be half because budgeting was not well done, you diverted the cash to entertainment which does not have profit and if one is disturbed..... if it is food you don't leave enough, you find that it will not manage to support these others. So, if you try to do something which is not close to these, you will find that your cups will be half; meaning that there is a connection – if one is disturbed then it will disturb all these others which follow so we have seen that they are connected.

E01 - 170 Okay thank you. Now apart from that, what things will make these cups go down?

P04 - 171 We said these cups can go down like on food, if we don't keep enough food and if visitors come..... maybe a funeral, also there are a lot of unforeseen circumstances which comes and if you reserved little food, when a visitor comes or maybe a funeral that food will be eaten and it will finish and it will disturb the other cups so that you look for the food to buy and keep you for the whole year. So, when you are leaving food for the household, you should not measure yourselves but put more even for unforeseen circumstances.

E01 - 172 Thank you. Okay you can give him.

P10 - 173 Yes just to add on what others have said, because if we did not keep enough food, meaning when the time for farming comes we will be thinking of buying food and the farming will be affected because the money you were supposed to use to buy fertilizer will be reduced because of not having food, then if we have school going children and we don't have food, we will think of buying food because we don't

have and we may just tell the children to say even at school you need to eat and how can you go to school with no food. So, we will just tell the children to stop going to school until we find food, that's when that children will go back to school. So, on this one if we don't have food, we will be hired to start working for others and start doing piecework and if we don't have food we will not have the idea of buying a cow because whenever we find money, we will think of buying food. So, for the farmer to do farming, the food must be available and see if it is enough, then the remaining is what you can sell and see what to do next if it is buying inputs while food is there and you are food secure..... so that is what I have seen to say if this cup is affected meaning all these others will be disturbed because you will not succeed. If you are in poverty, it is just the same with someone who has a funeral.

P08 - 174 Also, when one is affected or let us say cash

E01 - 175 Yes

P08 - 176 Cup for cash is disturbed, meaning that even if there is more water from the rains, you will not manage to buy seed the way you wanted, it will be little, because cash here is not enough then also the food will not be enough and when the cash is not more, meaning the livestock will also get sick and die because of not having money to buy medicine, so if one is disturbed then everything will be disturbed and the cups will be half.

P01 - 177 Also, when we looked at these, we looked at the rains, water, because when there is a drought it can cause all these here to be half and if there is no water we can't find more food or produce more food so that we sell and have cash to buy inputs so that we use here so that we find food at home, so that we don't go for

piecework. So, water is very important, the drought which was there this year was bad because if it continued some of us would not have these here maybe we would just have remained with these here which does not require a lot of water.

E01 - 178

Okay thank you.

P06 - 179

She has said what I wanted to say

E01 - 180

That's what you wanted to say?

P06 - 181

Yes

P02 - 182

I am beginning to open up because I was not there last time.

E01 - 183

Then..... we also looked at to say what is it that we should do so that the cups can be doing what..... can be increasing right? Let us say on the part of food there, what is it that we should do? On land, what should we do? Did we look at these to say for these cups to be improving what should be done is this and that? If we didn't look at that.....say that we didn't look at that.

P0X - 184

We looked at that

E01 - 185

Okay

P0X - 186

talking to each other on those things we looked at

P09 - 187

I look at them from cash. Err.....we come to inputs, we looked at what you should look at, do I have..... the question is do I have implements to help me manage to farm, is it fertilizer or what..... do I have, then in answering this question you start looking around, searching like this cash..... you need to buy these things so that you increase.... so that you buy inputs if it is fertilizer or a plough – you are supposed to have these then on land, we looked at the land also to benefit from it we need to take care of it..... maintaining it..... one is to take care of it by applying fertilizer, manure or practicing crop rotation so that the land is always fertile for you to realize good harvest. When you realize a good harvest, we looked at

how much food have I harvested, from there you need to look at the barns, where should I keep this food from and how much should I store.....in looking at this you consider saying am I going to store the food..... you look at the size of your family and also the unforeseen circumstances; maybe you have a funeral, you look at whether the food reserved is enough to cater for such uncertainties. So, we looked at livestock too, we need to be increasing..... looking at your breed..... for cattle to be increasing, to be reproducing your desire should be that you look for a breed which is good, which is marketable that you can sell well so that they can help you by giving you money. Then we came around and looked at selling this food.... the one you have sold, when the money comes what is it that you should do? yes, buying things that are not here what we looked at..... to say if I don't do this it will be affected, that is to say to fight these challenges in other ways is to try to improve..... trying to be improving, to be progressing..... that is what I can remember.

E01 - 188

Okay thank you, anyone with an addition?

P11 - 189

Just like what they have said on water, if the rains can be enough that means that water will be enough and we can also be able to improve very much. Because if the rains are not good, it means that even if you prepare on these, the cups still would be half especially here in the village. So, the most important thing is to have enough water..... if rains are enough, these cups would also be increasing, they can just be increasing.

E01 - 190

Okay..... then what about this side? Mothers, what did we look at that can help us to say these cups can be improving?

P08 - 191 Mama, it is you I am giving the recorder

E01 - 192 Food..... to be..... yes

P00 - 193 the P00 is waiting for one to respond

P06 - 194 To add.....

E01 - 195 Yes

P06 - 196 On these cups instead of you waiting to say cash maybe I cultivate or I do what..... you may have cups that are being filled up to a certain level already you can do piecework..... money can be coming in. if it is business, money will be coming in meaning you can reduce on removing from the cup for cash; meaning that the cups will do what? will increase.

E01 - 197 Okay

P01 - 198 You mention the chickens you sold as well

P00 - 199 *laughing*

E01 - 200 She is saying that let her also report on the chickens she sold.

E02 - 201 Yes

P00 - 202 *continue laughing*

E01 - 203 Okay, wow in short, we looked to say there is a problem of water..... rains, a problem of cash, a problem of inputs..... the fertilizer, seed, a problem concerning land, a problem of food.

P0X - 204 Of food

E01 - 205 And the problem of what? of livestock. So, we looked at in most cases these are the problems that we face, now we say for us to put to an end to these problems, we need to put what..... we asked to say what is our desire.

P0X - 206 Pouring some water in the cup

E01 - 207 Err yes, our cups should be what? should be full

P00 - 208 To be full

E01 - 209 Then we looked at also apart from that, if they are full, this cup also affects the other cups..... aah most of the ways you have explained it is true, from..... if you start from here to say if it is food it will help you this side on land when working it will help you, we also looked at even from

what..... from land, if the land is fertile we manage to cultivate, we have food, we sell and at home we have food then hunger is what..... is stopped. Then if hunger is avoided, if there are other things we cannot do what?..... we cannot prepare because we produced well and sold.... there are some foods that we buy to say like kapenta because you had produced well you can also manage to buy food. Then we also looked to say for these things where to start from.....you need to start little-by-little, to say if it is this year you manage maybe it is what..... it is a 5kg of seed, you manage it well. Next year you increase to say maybe where I had a 5kg now I have a 10kg, you increase just like that, little-by-little. Then we also looked at to say there are some things that make the cup to be doing what.....

P00 - 210 To be increasing

E01 - 211 Err..... then working or maybe looking at food at home like.... sometimes there is carelessness, carelessness can bring about..... yes, then others explained to say maybe cash if we start buying anyhow it will also do what.....

P00 - 212 Reducing

E01 - 213 Then again apart from looking at this we also looked at threats..... we looked at things like sometimes there is what? There is a drought..... dry spell.

P00 - 214 Yes

E01 - 215 Sometimes..... we looked at to say diseases then also this side.....also what.....land. We looked at to say the crops are also attacked by diseases then we also looked to say, there is sickness, funerals also fight us..... so, on all this we come to discuss that planning to say..... having knowledge to say what am I going to do here helps..... so, there was another part of planning your knowledge also does what..... helps.

- maybe there is somewhere I have left out but I think most of the things, even those that were not their last time..... what we were looking at..... because the idea was to look at when you want to improve, there are a lot of things that you need to do what..... things that are connected. Maybe..... I don't know if we are together up to this point?
- P00 - 216** yes
E01 - 217 *I was just trying to make a recap of what we discussed so maybe you have something you would want to add.*
to
E02
- E02 - 218** No
E01 - 219 Then err, the question which is there because..... let me give a good example; some here say for our cup for land to do what? to be okay, for it to be improving, what we had looked at to say it is better to do what?change crops; crop rotation. It is better to be planting what?
- P10 - 220** Applying manure
E01 - 221 Applying manure, there was conservation farming, there was also what? legumes; groundnuts, mbambara nuts, cowpeas..... Now what we want to ask is that..... when you look at these things we learnt what things did you manage to say.... you do and what things did you fail to do?
- P0X - 222** *coughing*
E01 - 223 Yes
P08 - 224 This year?
P01 - 225 This year?
P09 - 226 He has said in our lives from the time they were here
E01 - 227 Yes
P08 - 228 All of them?
E01 - 229 From the time, we did what..... after learning we did what..... we left
- P11 - 230** Yes
E01 - 231 Now what happened?
P01 - 232 What we did?
E01 - 233 Yes
P09 - 234 What we managed to do
- P01 - 235** Should we also give you the cup mum?
E01 - 236 Yes, now here what is important is that we want to learn to say maybe each one because we are different to say for me friends, I failed because of this and that..... we can share knowledge to say here I managed this one, or no I didn't do it because of this.....
P01 - 237 It has gone half way
E01 - 238 So that we can help each other, have we agreed well?
P00 - 239 Yes
E01 - 240 Yes
P04 - 241 What option went half? I will explain what I managed.
E01 - 242 Yes
P04 - 243 I managed on land
E01 - 244 On land, yes
P04 - 245 Yes, crop rotation
E01 - 246 Crop rotation?
P04 - 247 Where I had planted groundnuts, I planted maize.
E01 - 248 Where there were groundnuts you planted maize?
P04 - 249 Maize, yes
E01 - 250 Okay
P04 - 251 yes, so I discovered to say what I learnt was something true/real.
E01 - 252 Okay
P04 - 253 Then also where I had planted maize, that's where I took groundnuts.
E01 - 254 Okay
P04 - 255 Then also the groundnuts..... I discovered that they were growing well, I was explaining on this one where I didn't even weed, I just left them.
E01 - 256 Okay
P05 - 257 But they looked like they were growing well, so I can explain on crop rotation to say what I learnt is real for me.
E01 - 258 Okay now what else did you try that did not work out?
P04 - 259 What I tried that did not work?
E01 - 260 Yes, what did not work?
P04 - 261 Yes, on food I tried..... I stored
E01 - 262 Yes
P04 - 263 But it worked because I still have maize.
E01 - 264 *laughing*
and

P00
E01 - 265 It worked, you still have maize?
P04 - 266 Yes, I still have maize, what failed here is cattle.
E01 - 267 Okay
P04 - 268 Yes cattle rearing..... I am still failing.
E01 - 269 Why so?
P04 - 270 So, what causes this is.....
P0X - 271 *halves the cup for livestock and E01 laughs*
E01 - 272 So, on cattle it is still half?
P04 - 273 On cattle, it is always half; buying a cow just after it finishes ploughing it dies.
E01 - 274 Okay, it dies.
P04 - 275 Yes, it dies.
E01 - 276 Diseases?
P04 - 277 Just after ploughing it dies even though they say here this medicine is the best on cattle; we insert but it still dies so what I am failing to do is cattle rearing but I am managing goats..... I am failing cattle and also still failing to keep chickens; if I keep one, it doesn't stay it goes back to the owner.
E01 - 278 Okay (*laughs at goes back*)
P04 - 279 Yes
E01 - 280 For the chicken, she says she buys but often it goes back to where she bought it from, so that she has failed.
E02 - 281 Okay
P05 - 282 Chickens and cattle are failing but the goats.....
E01 - 283 She is saying the livestock..... the cattle are..... yes
P09 - 284 Yes, what I have managed..... what is measurable, what I have managed
E01 - 285 Yes
P09 - 286 Available food. Food is always there
E01 - 287 Okay,
P09 - 288 Then since it is always there it means that even produced food is there, even surplus is there..... then land
E01 - 289 Yes
P09 - 290 On land, I managed to practice crop rotation on my fields where I planted a crop this side and it does well. Where I fail.... yes, I

manage some of them but what failed is to maintain the cup for cash. It is very difficult..... to maintain the cup for cash is difficult because there are a lot of cross cutting issues. Whenever I find cash there will be a lot of issues coming; maybe school children, diseases, travelling where I need to go and there are a lot of things which need cash and that's what makes me fail but I try to share cash or budget to say I should have inputs, but now where I fail most to maintain cash is on livestock. Sometimes when there is a disease out-break for livestock, mostly it happens that I don't have cash to buy drugs and on this one, that where I fail most. I can manage to share the cash equally for these others, but now when there is a disease out-breaks like in the rains season, you find that I will fail to buy medicine because it is expensive. So, my livestock is not improving because they die and those are the minus which are there on livestock and that's where I find a problem, I fail to match these two. Then on water, maybe though the drought has also affected us a lot, but that we can't cry much because it is for God or nature. But otherwise, the part where I am fighting hard is on the weeds..... the land is okay but the weeds and when the children go to school, the human resource is less, even hiring people is expensive, the herbicides are also expensive. So, on the livestock and weeding is where there is a problem.....so that I manage to maintain cash. There is livestock, maintenance for cash and weed control – that's where I still have a challenge.
E01 - 291 Okay now on the weed control you explained the reasons; people are expensive to hire, herbicides are also expensive and also your own household labour is low.

- P09 - 292 It is low
E01 - 293 But now there you have explained to say the death of the livestock is because you do not have cash by that time..... but this side where there is cash, what is the reason why there is lack of cash.....to say it is not enough?
- P09 - 294 Cash comes when I sell the crops..... that's the way I find cash and then it is used differently. Cash is used so fast and that's where I haven't seen to say why does cash finish so fast and I fail to keep it or let me say it is difficult to stick to the budget because there are pressing issues and when that thing comes it will force you me even to do it even if I planned in a different way. I just get and I get something which was not even planned for in the budget.....but because there is necessity of that thing to be done and I am pressed by that thing, I will divert some cash and as a result I will have a problem the other side.
- E01 - 295 Okay
P09 - 296 Yes
E01 - 297 Alright, others?
P08 - 298 P10 what do you think?
P09 - 299 I think on this one what contributes most or the contributing factor which I have seen is when the family is big.
- E01 - 300 Okay
P09 - 301 Extended family. Helping even the elders and their children, I think this one presses me and you find that cash just goes to helping people and it reduces while the source is just one..... I don't have another source other than farming.
- E01 - 302 Oh so no business?
P09 - 303 There is no business which I do
P07 - 304 For me as well, sometimes you can try to force yourself and on food I manage.
- E01 - 305 Now what did you manage to do?
P07 - 306 What I managed?
E01 - 307 Yes, from what we learnt last time
- P07 - 308 Yes, I planted crops on the field and that was groundnuts and some few lines for cow peas.
E01 - 309 Okay groundnuts.
P07 - 310 Yes, later on when I harvested these and planted maize, the harvest for maize was good.
- E01 - 311 Okay
P07 - 312 Yes, the harvest of my maize was more.
E01 - 313 Okay so crop rotation.... you exchanged where there was.....
P07 - 314 Where there were groundnuts I planted maize.
E01 - 315 You planted maize.
P07 - 316 Yes, where there were cowpeas I planted maize.
- E01 - 317 Okay
P07 - 318 The harvest was good and from it I managed to find food.
E01 - 319 Ooh food available
P07 - 320 Yes, even now I am still having the same maize..... now because of having a big family as my father said, when you are just alone, whoever comes and complains.....and you being a parent you will say since I have, you just get from the barn, sell and help that person. Yes, even travelling, like today you are the one who brought us here with your transport from Lusaka and when we went there we carried some things to give the children in Lusaka, also to see how they are living and you being a parent you just get and give. Now for you to find something to reserve so that you use in the future is difficult and I fail on that one.
- E01 - 321 okay, now food, having food at home.....before your learnt, how was it?
P07 - 322 It was little
E01 - 323 Okay, anyone to add on?
P02 - 324 My addition is that as I have heard the majority is just talking about cash, when cash finishes in the house meaning everything in the house is disturbed, yes, it can be like that but the major desire is to make sure that the cups are all full now where there are more problems is on rains.

- Yes you can plant quite okay and when you finish planting when you are lucky and rains do well, we can manage to harvest thus make these cups full and if we are not lucky and the drought comes it can make these cups half and if we are lucky rains do well we can manage to make the cups full, also when it's too much such that there are floods, it can also disturb our cups.....we can't manage to make the cups full like the way we wanted because floods destroy crops, so selling is not the only way which can make the cups half but also floods.
- E01 - 325** Okay, maybe there are some more who have something to say because we wanted to hear to say from all the lessons, what did you do after learning and what did you not manage to do?
- P01 - 326** Let me make it half, I show you what I did, here for me from these lessons.....
- E01 - 327** Yes
- P01 - 328** On cash, it was half again it did better also on the food last year I just produced little food; 2 oxcarts are what I produced.
- P08 - 329** Where?
- P01 - 330** I am still here
- E01 - 331** On the produced food?
- P01 - 332** Yes, I produced little food, just 2 oxcarts.
- E01 - 333** Okay 2 oxcarts?
- P01 - 334** Yes just 2..... that's what I produced. After that I had to put the maize in the bags from the lessons we learnt I managed to sell 2 bags.
- E01 - 335** You sold 2 bags?
- P01 - 336** Yes, after selling 2 bags, I kept the money.
- P08 - 337** Was the money enough?
- P01 - 338** No, it was little but I kept it and managed to buy fertilizer.
- E01 - 339** Okay so you bought inputs?
- P01 - 340** Yes, I bought seed and it is this year and after buying it....
- E01 - 341** Okay
- P01 - 342** I went in the bush to cut trees, burnt charcoal and I got cash.
- E01 - 343** Okay
- P01 - 344** So, I did not sell any other bag of food from the time I sold those two, I was just eating and I saw it to say cash is found in some things. So, I discovered that money can be found even in other things.....yes
- E01 - 345** Okay
- P01 - 346** Then from there.....
- E01 - 347** Wait just there, so you are saying there is what.....there is charcoal here which you used.
- P01 - 348** Yes
- E01 - 349** So, it is the one that increased the cup.
- P01 - 350** Yes, it is the one that increased the cup. It is the one that made me buy inputs this year.
- E01 - 351** Okay
- P01 - 352** Like I have explained this year I have increased because increasing the cups for cash this side.....so even on cultivating I have improved this year.
- E01 - 353** Okay....so even.....
- P01 - 354** Even the land, I increased a bit where I had planted groundnuts I put maize so it has become a bit big so even my harvest I will be a bit big..... it will be a bit full or let me just say it will be full at my level..... (*Bursts into laughter in happiness*)
- E01 - 355** She is saying that they stay from before and now she is saying that at my level the crop that I have seems to be okay.....at any level really, it happens to be okay.
- P01 - 356** Meaning that this year what I used to do like maybe let me sell so that I buy kapenta.....I used to refuse to buy kapenta because I just used to say if I have nshima, I cannot do any piecework, no.....relish is not a problem, I can easily get pumpkin leaves, delele and say let us eat my children but for me to say let me buy this I would have gone for a piecework.....but because I said even salt can be relish than buying kapenta even

though kapenta is also needed because it tastes nice.

E01 - 357 She is saying that at least now there is a possibility of buying other non-produced food like kapenta and the like but previously access to that wasn't.....

E02 - 358 Okay

P01 - 359 That's what I have discovered this year even this kapenta..... this yeah aah.... even now it is full

P08 - 360 You.....

E01 - 361 what didn't you do or what did you do but failed..... which did not work?

P01 - 362 What did not work out?

E01 - 363 What was not successful?

P01 - 364 What was not successful..... aah question?

E01 - 365 To say maybe you try.....because you were explaining that whatever you tried was successful.

P01 - 366 Yes

E01 - 367 Now when you look from the whole lesson in case there is a part you tried then you saw that it didn't work out.

P01 - 368 Oho livestock didn't work out especially on goats and chickens.

E01 - 369 Okay for the goats and chickens

P01 - 370 Yes, it did not work out even cattle.... I would say if cash increases this year I am going to buy. Also, school going children come..... they are taking a lot of money.

P08 - 371 Is there any cow?

P01 - 372 We do not have

E01 - 373 What about goats?

P01 - 374 You goats are there just about half the cup

E01 - 375 What.....? Mpongo is a goat.

P01 - 376 Goats were also attacked by diseases

E01 - 377 Diseases

P01 - 378 Defecating blood so we tried to cure the disease and managed.....they stopped. For chickens, it is also like we are beginning to fail in chickens because.....like my mother said to say you bring a cock but after

2 to 3 days it goes to other people, after reproducing that's when it comes back and you have not even one chicken so even that one has brought me down on chickens

E01 - 379 What about chickens....

P01 - 380 That is what I was talking about

E01 - 381 Yes, before you learnt, how were they?

P01 - 382 I did not have any chickens; they had finished due to diseases.

E01 - 383 Oho that time there was a disease?

P01 - 384 Yes

E01 - 385 Oho okay, maybe there are others who tried to say what worked..... what worked? What have you tried and what worked and what did not work?

P09 - 386 Mention others in short

P00 - 387 ***talking in the background***

E01 - 388 Okay

P07 - 389 Here just like we have said the challenges..... what has helped us from the time we learnt

E01 - 390 Yes

P07 - 391 We did not have..... we never used to think of these cups, we just used to work anyhow..... there was no budgeting, no planning; so out of the workshop the we had we received more knowledge on planning then we started budgeting, and have now started saving; having our own bank accounts where to save, having our own money and looking at sensitive areas that we learnt. We never used to consider them now the knowledge..... you have heard the way we have explained here meaning that we changed the way we were. We are now on another step such that now we look at other areas, we know that..... you can feel on your own that here the cup has reduced, you alone will know that this problem is because of this cup which has reduced. We remember those cups as we work.

P00 - 392 yes

P09 - 393 So, the workshop helped us..... we got something

E01 - 394 Okay.....yes

P01 - 395 Fill the cup to the brim.

P08 - 396 How do I fill it to the brim?

E01 - 397 Yes, we want to know.... here the challenges you did not....

P01 - 398 Yes, let's go we want to see available food, here things are hard

P08 - 399 Here challenges.....

E01 - 400 Yes

P08 - 401 there has been carelessness on this one, if it was not that we produced at least this size.

P01 - 402 Yes, here on food available

P08 - 403 Yes, on available food reduce the cup, there has been carelessness on this one.....it is carelessness that I am talking about here.

E01 - 404 Yes, was that after the workshop or before?this carelessness.

P08 - 405 This carelessness?

E01 - 406 Yes

P08 - 407 It has continued before and after.

E01 - 408 Oh, even after the workshop?

P00 - 409 It has continued

P08 - 410 If it wasn't planning on this one.... these days there are phones; if you put budgeting money there.....you put there, that is what helped to reduce this carelessness.

E01 - 411 Yes, now explain where phones.....is putting in the bank or what is it doing? Explain.

P06 - 412 And this carelessness.....

P08 - 413 You it is carelessness.....here putting money.

P01 - 414 Let us do this.....

E01 - 415 You were saying that....

P08 - 416 This carelessness sometimes is selling; maybe someone is selling fish and you exchange forgetting how you had budgeted to say this maize is for eating.

E01 - 417 Okay

P08 - 418 Sometimes when you are faced with a problem that we have also forgotten.

E01 - 419 Okay

P08 - 420 The carelessness which was there last time was budgeting. It

never used to be exact but this side we have been opened up to say if you find some money, you take it to mobile money and put.

E01 - 421

P08 - 422

Oho the banking.....

Yes, you put.... that is what came to reduce or control this carelessness.

E01 - 423

P08 - 424

Okay

Another thing that became good is crop rotation this side, when we planted we found that.....where we had planted maize, we put cotton and the cotton grew well, now maize itself did not grow well because of the dry spell.

E01 - 425

P08 - 426

Yes

Then we discovered that it is not just the drought itself, we thought things would be the same as maybe the way we buy a bag of fertilizer at K 200 in accordance to the amount of money in controlling that side.....we failed to buy fertilizer.

E01 - 427

P08 - 428

Oho

It became difficult.....the maize just became....

P01 - 429

P08 - 430

So here we reduce

Eeh.... Again, instead of planting 50Kg of seed we just planted 20Kg

E01 - 431

Oho, so you reduced.....but this side we solved the problem....

P08 - 432

E01 - 433

Yes, we solved the problem.

But then you didn't have enough money to...

P08 - 434

E01 - 435

P08 - 436

E01 - 437

P01 - 438

P08 - 439

to.....to increase here

Okay

Yes

Oho okay.....yes

You are not done yet?

Where now..... you want me to over explain so that you know what I did.....why force me? (*talking to the cousin jokingly*)

E01 - 440

P10 - 441

Yes

When we learnt, we learnt very well, the lesson was just okay

E01 - 442

P10 - 443

Yes

After learning, we tried to keep very well because of the drought.....the drought came and hit so like on my

side.....these cups will not be full like they are full now.

E01 - 444 Yes

P01 - 445 Where.... where (*reducing the water in the cup*)

P08 - 446 All of it

P10 - 447 Because there on land, if I cultivate 6 hectors then this is equivalent to 3 hectors meaning that 3 hectors were destroyed. As they have said also the prices for fertilizer have increased meaning that the other portions remained un-tilled..... then from there the same maize that we planted, the drought came and hit us so they did not have the right standard that they are supposed to be but at least food is enough.

E01 - 448 Okay food will be there?

P10 - 449 Yes, for food..... it will be there.

E01 - 450 Okay

P10 - 451 Now what has been affected is to say the cash is affected.

E01 - 452 Okay so the food will be there but cash this side will reduce

P10 - 453 Will reduce and also to think that even cattle also.....there will be nothing because we can only buy cattle if we had cultivated/produced well. Meanwhile, we can say that it is just half-half because only food will be available and the puzzle is on increasing the cash so on whatever we are going to find, we will have to consider only needs not wants.....yes that is where we are, we are talking about.

E01 - 454 Okay, alright maybe there is someone who wants to add?

P08 - 455 Mr. Kamanga you are sleeping?

E01 - 456 Now what of.....okay now we are going to have a break just for few minutes but before the break, I have two questions or three. The first one is looking at.....when you look at what we did last time or what we learnt, are there some things which you think of which we did not learn about? Because sometimes we forget, yes which you think that maybe we would have put a cup

for that thing and that thing is important, we need to put a cup..... so maybe there is something which we forgot?

P08 - 457 What of the piecework, is it there? Because this year there were a lot of piecework.

P06 - 458 Piecework was there, we talked about it.

E01 - 459 Okay so you are saying we should put a cup for piecework?

P08 - 460 Yes

P06 - 461 Yes, on piecework there was no cup

P08 - 462 There was nothing because this time....

P10 - 463 Now because we are just saying in terms of management

P01 - 464 There was no cup for piecework

E01 - 465 They are saying that this time there was a lot of piecework and we need a cup this time.

P09 - 466 No, let us ask the question properly.... are you saying that all of us are going to say we do piecework or are you saying that it is a must we should be doing piecework?

P08 - 467 No

P09 - 468 That is what I want to know

P08 - 469 The question he has asked is this.....

P09 - 470 Now it is just cross cutting

P10 - 471 No, that one cannot be okay

P09 - 472 Okay now what of if we just put it to say business so that we just do business?

P10 - 473 Yes, business can be there, because now we are just suggesting.

P09 - 474 Yes, maybe you open a shop so that you do business

P08 - 475 Was there business last time?

P10 - 476 That is what we are saying.....

P09 - 477 What we should do

P08 - 478 Business was there but had no cup

P09 - 479 Yes, what we should do so that we don't just stay..... we do some business maybe it is a shop or poultry.

P08 - 480 Now business or let us say business piecework.....we cannot put a cup because here what we are doing is business, that is what we are doing

- because in business we want to gain something and that's capital.... so, meaning those cannot have a cup.
- P09 - 481** Yes, I think we do that and otherwise it is catered for
- E01 - 482** Okay
- P09 - 483** that is why we do farming and it is business..... farming is a business.
- E01 - 484** Okay
- P09 - 485** Now is there something we left out which we did not do? That is the question
- P08 - 486** Yes
- P10 - 487** I think everything was covered
- E01 - 488** Okay, how, mmhhhh how many tried after the lessons..... I think there were come complaints or not really complaints but you men were saying women should....
- P08 - 489** Should be here!
- E01 - 490** yes, and where you needed them most was on that one, yes to say...
- P09 - 491** Yes, they are careless on that one (food available)
- E01 - 492** Yes, now I want to know how many of you took the information to say I think on this one, we need to be together so that the cups are....
- P09 - 493** Are full
- E01 - 494** Yes, so I think you have seen the idea why we said both of you should be here for this workshop.
- P00 - 495** Yes
- E01 - 496** Yes, so how many tried that? Yes...
- P11 - 497** I think for me, my wife is not careless, no; she does not do that.
- P06 - 498** But both of you just had to come so that you learn together.
- P11 - 499** She is not around; she has gone to the field to harvest groundnuts.
- E01 - 500** Okay, but have you heard the question?
- P08 - 501** Yes
- E01 - 502** Yes, to say how many went and told the women to say what we have learnt there is this and that?
- P10 - 503** I took the information and I told her to say the lessons which
- were there are this so that next time even women should go because at first, I told her that the meeting was for men only but when I went back I told her that I just made a mistake, they said even you women were supposed to be there. I think that's delivering the information, right?
- E01 - 504** Yes, now taking the information is it just saying even you.... you were wanted and not explaining to say what we learnt is this?
- P10 - 505** No, I told her
- E01 - 506** Okay
- P09 - 507** I told her that this is what we learnt.
- E01 - 508** Okay
- P09 - 509** Now the step I took was that I told her that she is the one in charge of food now and I told her that we learnt not to be careless with food or misuse food and I gave her power to be in-charge of food..... and also when you entrust someone you give them a job, things become tough such that there is no getting of food even for me as the boss.....there is no getting of food, even just a little.
- E01 - 510** Yes continue
- P09 - 511** So, there was some strictness and I said this manager.... I made a mistake to give her powers, how I wish I was just doing it on my own because sometimes I would want to get, but she will say, "where are you taking it? That's being careless, isn't that what you learnt?" So, you want to go against what you learnt and that which you told me? But anyway, my manager works very well though she is too strict. Yes.
- P08 - 512** It is coming, like what I said that is carelessness.
- E01 - 513** Yes
- P08 - 514** Yes, because last time my wife was not here and that's where I found that some of the food is missing and if I say some, I never used to bring here, that's why I said mobile money because if you did not learn both of you still

even if you explain to your friend.... some won't get that this is the way..... for her, she will think that I am taking somewhere not knowing that I am putting here.

P06 - 515 Without her knowing?

P08 - 516 Yes, without her knowing, now even if it finishes here..... here it can help me, yes even today she is absent, so even at the bank we started banking and I told her that, "look what you used to do last time, now it is like this".

E01 - 517 Okay

P08 - 518 And I told her that if we reduced on that one, we would have bought something just like now we are about to enter into winter, we need blankets.

E01 - 519 Okay

P08 - 520 We would have bought but now we take it back to food again.

E01 - 521 Okay alright

P01 - 522 Give my uncle even a visitor can contribute.....uncle, we give you also to add for us.... yes, just give him.

P09 - 523 He will talk about what he has heard.

P01 - 524 Yes, what he has heard.

E01 - 525 Yes, it will come around.....

P09 - 526 Decision making.....

P12 - 527 Thank you even though I found the lesson is in process but I have picked at least one, aah the first thing is that lessons like this one..... the truth is that all of us in the house need to be together because what follows is that one day one will remain alone and when that happens. These cups..... just because one has died all these years they used to be full but just because one is no longer there, all the cups reduce, so the encouragement is that when such lessons come, maybe the whole family should be attending even children because they also grow so they are supposed to start leaving them to say land is to be taken care of.... food to be taken care of everything.... if there is anything here it is just a few that concerns

our lives. Now.... especially women, there it can be a chance to learn so that when the husband leaves home it is not only an opportunity to start selling maize because the cup will run dry and because as they sell maize the goal is not to fill the other cup, no. they just sell anyhow, there is nothing like after selling the money is meant to fill the other cup but the money goes to fill the bank whose ownership is unknown, such lessons.....

E01 - 528

P12 - 529

You can continue.

They are nice/good if we benefit from them, cattle breed would also change because the reason why cattle breed should change like you were saying..... it is also a business, everything here collectively is a business; management of land is a business, management of money is a business. So, if our business is to grow it has to be supported by these aspects represented by cups. This cup which is here is supposed to help that one.....when that one is about to run dry, I heard someone was talking about piecework. We reserve a lot of food here in the village because what we do is that this side on land we face what.....

P00 - 530

P12 - 531

Not attacked by weeds

.....we do not experience carelessness such that we fail to manage the maize so you would find that they are rotating when time comes; what was that side goes the other side, no. it is not good for that one cup should completely go down, they are supposed to be supplementing each other, meaning that if these cups are on the same level, life would balance, we would manage to support school children, you respond to whatever comes. These cups should be responding to each other, if they do that than our lives would be good. This is the

lesson I have seen..... this lesson is very good.
E01 - 532 Thank you, there were other hands.
P08 - 533 You have forgotten
P02 - 534 It is me.... yes, what I want to say is that he showed me what they learnt then from there he appointed me to be the overseer of the storage barns.... and I made sure that I controlled them such that on cash I never thought to say maybe I buy a tin to feed my family, no. Even now my cup for food is still full..... the only thing that I touched in the barns was to get a little to sell so that we pay school fees for the children.
E01 - 535 Okay
P02 - 536 Up to now my barn for food is still full because I was shown and learnt too, even here if I was to remain alone with the cattle I know all the places where the medicine is bought for treating animals.
E01 - 537 Okay
P02 - 538 Because we always move together and as we go he shows me the shops because he tells me that, "you should also attend when the workshop shall be called".
E01 - 539 Yes
P08 - 540 Should we remove or you have all heard?
E01 - 541 What I have learnt as of today..... the other thing that we did what..... what was not there, it is the issue of charcoal. Last time it wasn't what.....
P00 - 542 It wasn't there.....
P10 - 543 We only had planting
E01 - 544 Was not there no.....we only had piecework but not what....
P08 - 545 Charcoal
P06 - 546 Even here, that's what she has said that, "I also didn't know"
E01 - 547 Yes so..... now what we want to do is this, we want to go to the second part.... aah I don't know if there are questions from the first part, because this one we were just reminding each other to say what we learnt to-

date.....this is where we are, from here we look at what lesson should continue and then whatever we are going to look at, then how is it going to help us..... so maybe there are questions..... any questions on this part? or maybe we can continue.... mothers?

P07 - 548

E01 - 549

Let us continue

Okay so.... aah.... so, what we are looking at here..... we are looking at the same idea of saying what we improved and also to look at.....you were saying that these cups are supposed to be helping each other so that they do what..... they can be improving at the same time. Now the idea is the same with what we are going to look at.....what we have been looking at here, we were looking at.... there are sometimes others did while others did not do anything. Others touched different aspects, to say even us.....God blesses us differently, our starting points are what.....are different but the idea is the same. Aah now we are going to look at number one, the idea is that.... now.....in future the way things are changing what things are we to do so that when that time comes it finds that no.....these people are prepared, not to be found that we have but no plans.....problems.....you were saying that there is drought this side right?

P00 - 550

E01 - 551

Yes

What if it continues, what are we to do now so that in future we will say at least we started early doing what.....

P05 - 552

E01 - 553

Learning

Preparing. Now what we have been looking at previously.....what we have been doing is much of short term preparations to say what I need to do here is this.....but today we are saying no, let us not just look at this year and next year

but what about the years to come? What lessons should we have.....in short what ways, what is it that we are to do now so that in future our lives.....the cups too should be doing what.....to be full. Are we together up to there?

P00 - 554

E01 - 555

Yes

so even this..... this side concerning charcoal we will also do what..... add it together aah.... so, the whole idea is not to look at this year only, and most of you said that even this year your harvest will be good; but now we want to look at the part of the children.... do you think you have prepared for them very well so that when they reach your age they will be saying the cups are okay or they will find that even just one cup is not there. Yes, so we are going to go on break just for few minutes and on the same break we want chibwantu (sweet beer). You don't want chibwantu so we have brought you what you want and we will request for chibwantu so that we exchange. But now let us note that this is not the end of the workshop, no. let us agree that it is just a break for about 10 – 15 minutes then after that we will continue with our lesson for today, are we together on this one?

P00 - 556

E01 - 557

Okay

P09 - 558

Is it just stretching or....?

E01 - 559

No there are some drinks which are there

E01 - 560
and

E02

During the break no discussions between the participants, interviewers are talking to each other

E01 - 561

Now the second part or those papers are a reminder to you to say this is what we have done so far and this is what we discussed, then now the knowledge from this one will also be used. Yes, so that everyone should have those papers. Before we go further, we want to tell you the

whole idea again for this meeting today – from the beginning we were just trying to remind ourselves of what we did last time and seeing where we got the knowledge, where we had difficulties and the like.....now the lesson for today is looking at our desires; what ways can we use so that our improvement is not just for one year, but that the improvement should continue if it is 5 to 10 years and it is like a spring for the car which starts from the beginning until it goes up not so?

P00 - 562

E01 - 563

Yes

Yes, improving so that after 5 or 10 years, you say we started from that step and we have improved until we are now better and that is the main idea for today. And looking at the way things are changing like rains are also changing, the livelihood is changing not knowing if it is improving or it is becoming difficult..... we will see in the lesson. But the whole idea from the first lesson and the lesson for today is just the same and that is development. Just to add on that one if observed from the time we started mostly we are trying to help one another through lessons, some help through giving material things; maybe when they come they will tell you to register your names and you register but for us from the time we started, our main area is just lessons. But it is just that we said no our research should be like the way we do it every time, if it is a questionnaire just that, no. So, we said let us try to teach each other with the farmers and let them try so that we see where they are able to do and what knowledge they have, also what knowledge can we also add on so that we see how we can work together in thinking and decision making as farmers with us from the University. So, the area we help mostly for us is on lessons;

- trying to remind each other in case you had forgotten in some areas and when you look you remember to say there was even a cup for this and you will see to say I almost went out of the way.....maybe you have something to add? I was explaining on....
- E02 - 564** I don't know what you said
- E01 - 565** I explained the objectives for this workshop and also our main purpose really is to help the farmers take control of their decision making for the better and their resource management for the better not necessarily that we have to give them something or the and outs or whatever.... but focus is to improve them on knowledge perspective, then my last statement was for you to make any additions.
- E02 - 566** I don't think I can add..... that's fine.
- E01 - 567** Okay then we can start the lesson which follows, I don't know if you have heard the reason for our coming here because nowadays things are dangerous.....we can just hear to say Dr. Nyanga had a campaign rally, no we haven't come for campaigns but our campaign is to make sure your livelihoods are improving. Yes, now you will forgive us because the rule for us who do research is to ask or request everyone to be free or can we continue because we had the first lessons and we explained and now is it okay if we continue working just the way we were doing?
- P00 - 568** Yes
- E01 - 569** Okay, alright. So, without wasting much of our time, I think everyone has those papers, alright now mostly we farmers.....when we are planning, do we plan or how far do we go in terms of planning? Do we just plan for that specific year to say this is what I am going to do or you plan for the next 5 to 10 years? How do you plan.... Women? or you just plan for the day and forget? Where is the recorder?
- P12 - 570** Our preparations mostly as farmers..... it only happens.... actually, planning in most cases starts when we see the clouds forming, that is when we start asking ourselves – where is the seed? Are the yoke pegs ready? because even those pegs you find that they are only for one season. In a nutshell, our planning starts..... if it starts in December, it again stops the same month and then we start again. It just rotates like in a cooperative where they say contribute money, fertilizer comes and again when the time comes, contribute money.....they register and there is nothing else that goes beyond 12 months, maybe our planning doesn't even reach 12 months.
- E01 - 571** Okay.... maybe there are others who have an addition..... any addition mothers, how is our planning? How do we prepare?
- E01 - 572** His explanation is that when it is almost rain season that is when it triggers to say let us plan. **(explaining to E02)**
- E02 - 573** Okay
- E01 - 574** Yes, mothers; how is it? Do you still remember the rules we agreed upon when we started?
- P00 - 575** Yes, to be free
- P09 - 576** To be free
- E01 - 577** be free
- P09 - 578** It is to say anything
- P08 - 579** Again, just like he has spoken, there is no time we think of planning in long term like for a period of 5 years.....we don't think of that. If we think of it we just say if God will still be giving me life.
- P00 - 580** Yes
- P08 - 581** That is where we end, we don't plan to say when I farm next time this is what I will do.....we don't do that.
- P00 - 582** Okay

E01 - 583 Okay now.....how are we going to put this one.... aah.....because when I write like this, they will be able to read from this side. Yes, or maybe we write like this, I start from there

P00 - 584 Yes

E01 - 585 Yes, now when we check this side what we have been learning, there is a part maybe just one that we can say..... aah okay we put areas.... The part or aspect which is important.... environment in Tonga, how can we put it?

P0X - 586 Talking to each other.....

E01 - 587 No, don't whisper to each other..... okay, in short, we are going to use things that we find surrounding us.

P0X - 588 Within our area?

E01 - 589 Yes, in our area.... aah because this preparation is concerned with.....

P0X - 590 Where we live?

E01 - 591 It concerns where we stay, where are all the fields found?

P12 - 592 Around where we stay

E01 - 593 Now here most importantly we are going to look at what..... rain. Do we agree that rain has a part in our environment?

P0X - 594 Yes

E01 - 595 Okay the other thing..... aah what we are going to look at..... because there are a lot of things that we find in our environment. I have just given rain as an example but there is another thing; let us say in our environment because others were saying cooperatives so that you find what?

P06 - 596 Fertilizer and seed

E01 - 597 Fertilizer and seed.....where do they come from? Yes, don't just whisper, say it aloud.

P03 - 598 from farming if you cultivate

E01 - 599 It comes from farming if you cultivate?

P00 - 600 Yes

E01 - 601 Okay is there Farmer Input Support Program (FISP) here?

P00 - 602 It is there

E01 - 603 Okay it is there..... are they the same?

P00 - 604 Yes

E01 - 605 Cooperative?

P00 - 606 Yes

E01 - 607 So, who have power..... who are the owners of cooperatives?

P12 - 608 The government

E01 - 609 It is the government?

P00 - 610 Yes

E01 - 611 Meaning that the government also has a part in our area where we do what?

P00 - 612 In the area where we stay

E01 - 613 So, we can say it is not just the environment but also what?

P00 - 614 The government

E01 - 615 Meaning that in starting we can put the government or others in English would term it as "policies" or what..... or maybe we just put it say government.... this FISP becomes what.... an example, right?

P00 - 616 Yes

E01 - 617 So aah the other part is..... even social economic life has a part in the way people do what.... the way people live. Yes, now aah if we will have time, we will also look at the way we live, the business of our lives..... you said maybe our lives are now okay; there is a lot of money or maybe it has become difficult..... It concerns what.... life. yes, the other side we were learning that something like that is problematic like maybe it is a funeral, sickness..... all this is what?

P00 - 618 It is life (socio-economic life)

E01 - 619 Social economic life (the way we live) yes, so.... aah it is not that this lesson is different from the one we started with no, they are just the same because all these we have been doing what.....what we have been talking about happens in all these, right?

P00 - 620 Yes

E01 - 621 So, when you want to fill the cup, it is within what? To say maybe we want this cup to be full, the government also has a part to play..... it is not just FISP but FRA also does what.....?

P00 - 622 Has a part
 E01 - 623 It has, right?
 P00 - 624 Yes
 E01 - 625 And also, just the socio-economic life to say this side the price for soya beans has risen, this side they sell well.... this side the price for cotton has reduced.....affects to say maybe your cup this side will do what?
 P00 - 626 It will be full
 E01 - 627 Are we together?
 P00 - 628 Yes
 E01 - 629 Okay I wanted us to see that these are areas we are going to talk about, then on these ones we will not look at everything, no but we will just get one part..... that we will consider. So, it is not that we will look at everything but maybe each part we will pick one or two options.... okay. Now, apart from that let us say maybe we start from there on the environment (rain).....how are the rains? Sometimes they are okay while other times no.... when are we supposed to prepare much? When it is raining very well or when it is not?
 P00 - 630 *whispering to each other*
 E01 - 631 did you get my question?
 P06 - 632 Yes, but because we cannot tell to say maybe this time it will be good or not.... maybe when you prepare.
 P02 - 633 It rains very well or it doesn't?
 P06 - 634 Or maybe when you don't prepare it rains badly.
 E01 - 635 Okay, what if you prepare and it rains well? What do you think would happen to the cups?
 P00 - 636 They will be full
 E01 - 637 They will be full?
 P00 - 638 Yes
 E01 - 639 Okay what if it doesn't rain well?
 P06 - 640 The cups will be difficult
 P02 - 641 It is hard
 E01 - 642 It becomes difficult, it is hard.....
 P00 - 643 Yes
 E01 - 644 That is where we want to see to say what of if things are not okay, because don't forget the whole idea is to make sure that the cups are....
 P00 - 645 are full
 E01 - 646 Yes, even if there is a drought at least you should be saying, "at least for me things are okay" yes, that is the idea, right?
 P00 - 647 Yes
 E01 - 648 Exactly, so now I want all of us to look at.... if it doesn't rain well here or let us say the drought continues, how do we prepare? Okay you said when preparing you just look at cattle and others but now we are looking at to say how do we prepare so that our cups are....
 P00 - 649 They are full
 E01 - 650 Are okay in an event that the drought continues.... how do we prepare? Are we together on this one?
 P00 - 651 Yes
 E01 - 652 Okay, now we are coming to that side
 P06 - 653 That is why I have held it in advance.
 E01 - 654 She was making a comment that the answers are there but maybe how to express them because I was saying in a scenario where the rain season/pattern worsens. How do we manage it? So now we just want to make sure we are together on the lessons not just looking at things when they are good. What of fertilizer and seed for you women are the prices increasing or they are reducing? What is likely to happen?
 P0W- 655 They are increasing
 E01 - 656 They are increasing
 P0W- 657 Yes
 E01 - 658 Okay what of the fertilizer support program from the cooperatives, are the packs increasing or they are reducing?
 P0W- 659 They are reducing
 E01 - 660 They are reducing meaning they are becoming bad now what of..... I was asking if the prices of fertilizer are reducing. Now the idea is to look at when things are becoming tough or changing so how can we prepare also.... not just preparing in terms of

- cultivation, no, but preparing in case things become bad and we are seeing that things are becoming bad.... what of the livelihood?
- P0W- 661** It has become worse because things we use are really seen.
- P08 - 662** Because there if rains do not do well fertilizer is also a problem; now how can you survive? There is no way you can survive because if rains are not enough, fertilizer is also expensive. And also, the packs.... maybe you are 100 people in that cooperative; out of 100..... and if they say we are just going to give 15 packs, now what of these others.... so, you have seen meaning that even livelihood will be bad.
- E01 - 663** Oho
- P08 - 664** Yes
- E01 - 665** Okay, yes so linking the 3
- E02 - 666** Okay
- E01 - 667** Yes, so that actually these are together. Okay so if we are to put ourselves on this meaning we will not be happy, things are....
- P00 - 668** are tough
- E01 - 669** Okay meaning even here, now.....
- E02 - 670** She wanted to say something
- E01 - 671** Okay talk
- P07 - 672** Life has become tough or it is becoming tough.... like for me.... I am in a cooperative.
- E01 - 673** Okay
- P07 - 674** They introduced vouchers
- E01 - 675** Okay
- P07 - 676** Up to now I haven't received all the bags for fertilizer.... I just received 2 bags instead of 4. Isn't that what we call tough? Because in the past we used to get fertilizer early as long as money goes to the bank and you will get your fertilizer, but now life is becoming tough, even I have not received my fertilizer.
- E01 - 677** But you paid money
- P07 - 678** Yes, I paid money long time ago.... I was just given two bags.
- P10 - 679** Two bags
- E01 - 680** Two bags
- P07 - 681** Yes
- E01 - 682** Then you paid money for how many bags?
- P07 - 683** I paid for 4 bags and a 10kg seed but I did not receive the seed as well.
- E01 - 684** Okay so she is giving a case of the hardship that she paid but they were given half of the inputs on FISP's part that actually things are....
- E02 - 685** Bad
- E01 - 686** Yes, also that previously they could get more. Now I think we are together and we have seen that our cups work in these different aspects, there is rain, there is government and also livelihood is there.... now why we have come is to see how we can improve even though things are bad..... but maybe we can make some decisions which can help us so that our cups don't.....
- P04 - 687** become half
- E01 - 688** Yes, maybe there are some questions on this one.
- E02 - 689** **asked E01 something**
- E01 - 690** No, no I was just on this that maybe anyone with a question. Okay what of if we do this looking at what we should do because in the first lesson we were looking at almost one year planning to say if there is this then I can do this, now we are looking at it to say things are changing and if things go to the worst such that it stops raining well, what are we supposed to do so that at least our cups are.....
- P00 - 691** Not half....
- E01 - 692** Yes, so maybe we can start looking at options or things which we can do in case rain is not there so we can say..... what can we do?
- P08 - 693** **P01** life is tough
- E01 - 694** Okay you still remember the cups, right?
- P00 - 695** Yes
- E01 - 696** Or maybe you want us to start with..... if the rains become difficult, what will happen to the cups..... aah.... what can we do?

P00 - 697	laughing		
P11 - 698	What is needed to be done is that we are supposed to keep some livestock; like goats, pigs.....so you should have. They can help you like if the rains continue being problematic here in the village.		correct or wrong, no, everything, all the responses are okay.... what is different is the activities to say this one can manage this while this one cannot, this one..... yes, there is a hand there....
E01 - 699	So, you are saying aah..... livestock? Okay what else? What else are we supposed to do? we start preparing in advance to say this rain....	P02 - 719	Me? No, I am still thinking
		E01 - 720	Yes, the cup for.....if we say the cup for cash; how can it improve in times when the rain is continuously poor.... where can we touch?
P00 - 700	whispering to each other	P01 - 721	It cannot improve at all
E01 - 701	No don't whisper to each other, talk loudly.... you can give her the recorder.	E01 - 722	Yes
		P06 - 723	The cup for cash..... if it is not raining, it cannot improve because all we want to do so that the cup can be full depends on water from rains. Yes, in line with what we were learning, yes.
P09 - 702	Talk loudly		
E01 - 703	Yes	P05 - 724	Now where we have reached, where others came to say charcoal burning.
P09 - 704	Don't make other meetings behind there	E01 - 725	Yes
P00 - 705	This lesson is hard	P05 - 726	Because the rain has become difficult so we resort to charcoal burning.
E01 - 706	So that.....	E01 - 727	Yes charcoal.... what else?
P01 - 707	Unless I prepare next year.... I don't know where I am going.	P02 - 728	If you know how to sew....
P02 - 708	You can prepare just a little you can even be doing a garden, just like that.	E01 - 729	Yes
		P02 - 730	You can be sewing just like that you will be helping yourself.
E01 - 709	Okay, gardening.... what else?	E01 - 731	Okay
P13 - 710	The question is a bit difficult for them to come out very well	P01 - 732	It is business
E01 - 711	Okay maybe we do this....	E01 - 733	No, because now let us just list then we will group them nicely to say this one....
P13 - 712	The problem has been identified; this rain is the problem.... now what else can help our lives to be okay?	P05 - 734	Yes there
E01 - 713	Yes, so that our cups can be what?	E01 - 735	Yes..... yes, what else?
P13 - 714	They can be good	P09 - 736	You can bring it up here
E01 - 715	Yes	P0X - 737	It is just like that.... it becomes difficult if you experience droughts, because you cannot completely run short at least others will be able to produce....
P13 - 716	Some said we rear some livestock, others said that not just that but also gardening.... what other things can be done?	E01 - 738	Yes
P05 - 717	I think if the rains become problematic I cannot do even a garden because there are no rains meaning there is no water..... even a cow needs water and grass and I think if the rains become problematic, the way I can prepare is.... it is called business; selling things.	P0X - 739	You go to the river and order some and start exchanging with maize
E01 - 718	Business, okay.... yes? now here we should not say maybe this answer is the one which is	E01 - 740	Okay
		P0X - 741	You can find food
		P07 - 742	Or maybe just like the way us old women are.....you can hire someone like maybe you even buy two goats and take to

	Kasumbalesa. When he/she brings the goats, you can think of another way		them.....do you have anything to say the options for the rains.....
P09 - 743	What thoughts?	E02 - 765	No
E01 - 744	They are asking what thoughts.....	E01 - 766	Okay, can we go to the second part this side?
P00 - 745	talking and laughing	P0X - 767	If more options or ways come through, you can mention them.
P08 - 746	what she is saying is that.....	E01 - 768	Yes, if you have remembered something again we can go back there and do what.... and add..... now we have come to fertilizer support programs or maybe it is farming input support program.
P06 - 747	Talk about that money they bring for you		Yes
P08 - 748	The money that comes after selling those goats..... so now you decide on what to do with it, if it is buying mealie-meal....	P0X - 769	Maybe we just get it collectively.... no not collectively – we will confuse them, but separately; this one for FRA.... maybe nowadays they pay you early, but let us start this one; fertilizer support program
E01 - 749	Okay	E01 - 770	Yes
P07 - 750	Yes, you can even be buying salt at home.... you can even be selling one bag of salt, just like that you can be making plans		aah what if.....we have seen that the situation in the future.... to say it will be worsening at least they will say there is completely nothing.... what are we to do? The options...
E01 - 751	Okay, yes	P0X - 771	Then even fertilizer becomes difficult.... they will not help
P0X - 752	It is to get busy	E01 - 772	Yes
E01 - 753	Yes.....	E01 - 774	You need to use manure
P00 - 754	The audience laughs	P08 - 775	using manure
P09 - 755	When we talk of rains, God cannot forget us, at least a little can be there.... it is to plant crops that are resistant to droughts like cassava, it is to change crops to those ones that can grow even in times of drought.... for example, cassava....	E01 - 776	Yes
		P08 - 777	Two.... oh
P00 - 756	whispering	E01 - 778	I can just be growing groundnuts which do not need fertilizer
P12 - 757	Just like they have said that rains cannot completely stop.	P01 - 779	Okay
E01 - 758	Yes	E01 - 780	Because if I grow groundnuts, that do not need fertilizer, there are those who manage to buy fertilizer.... I can be exchanging with maize.
P12 - 759	What we consider when the rains reduce.....we look at the varieties we are going to plant so that immediately the rains come, the maize ripens so that food security is assured at home or protected.	P01 - 781	
E01 - 760	Early maturity..... what else? Okay aah..... I think you have seen that the rains are able to affect those cups, right?		
P00 - 761	Yes	E01 - 782	Okay
E01 - 762	Now the idea is that even when things become bad, there are other ways.... what can you do what?	P01 - 783	Yes
		E01 - 784	What else....?
P0X - 763	You can use it to pull through.	P0X - 785	And growing sunflower
E01 - 764	Yes now, these are the ways we have put here, if other ways come through that we have not included, we can include	E01 - 786	Sunflower
		P0X - 787	even cotton
		E01 - 788	Okay cotton
		P08 - 789	Millet
		P06 - 790	Cowpeas
		P08 - 791	cowpeas....
		P0X - 792	Then you take these to FRA

E01 - 793	laughing	E01 - 824	Even when it does not you know
P0X - 794	Yes, it is to take....		to say where to touch.... yes....
P08 - 795	sweet potatoes....		okay
P0X - 796	whispering to each other	P08 - 825	Cucumbers too
E01 - 797	What else? Fertilizer has	E01 - 826	What? Cucumbers?
	become expensive and	P08 - 827	Yes....
	difficult.... the government is not	E02 - 828	I think I have a question
	giving you in good time, what are	E01 - 829	Yes, she has a question
	you supposed to do so that those	E02 - 830	Back to the rains
	cups even though the door for	E01 - 831	Just there on rains....
	fertilizer has closed but you can	E02 - 832	Actually, I have two questions;
	open other doors to say even		one is a small one – what does
	though there is nothing this side	E01 - 833	business mean? Option three
	but it will win this other side so		What does this business on
	that the cup can be filled.		option 3 mean? What were we
P02 - 798	Potatoes		saying that if rains are
E01 - 799	Okay potatoes.... these same		problematic, what would I do?
	potatoes?	P08 - 834	There on top we have livestock,
P00 - 800	Yes, the same potatoes		there we have cattle, right?
P08 - 801	Sorghum	E01 - 835	Yes
E01 - 802	Sorghum....	P08 - 836	Buying cattle
P00 - 803	whispering	E01 - 837	Buying livestock
P02 - 804	I was saying potatoes.....	P08 - 838	Yes, taking cattle in towns to go
P00 - 805	laughing		and sell
E01 - 806	Okay, maybe there are other	E01 - 839	Okay selling
	things we have forgotten.	P08 - 840	You go and sell goats
E01 - 807	Okay	E01 - 841	Okay
P02 - 808	Even sugarcane can be grown if	P08 - 842	Yes
	you don't have fertilizer.	E01 - 843	So, going to....
P09 - 809	This is sorghum	P08 - 844	you go to the river and buy some
P02 - 810	Oh, it is sorghum?		fish to go around selling
P00 - 811	No	E01 - 845	Okay so meaning that even....
E01 - 812	Let us put sugarcane....		aah so he is explaining that
	sugarcane		trading in livestock and also
P00 - 813	whispering		going to the.... ah.... what river is
P04 - 814	Pumpkins		that?
P03 - 815	water melons	P08 - 846	Lukanga
E01 - 816	Okay oho.... okay	E01 - 847	Lukanga.... going there to buy
P08 - 817	This is where you need to start		fish for selling
	an orchard	E02 - 848	Okay
E01 - 818	Growing some fruits	E01 - 849	Then he also added that these
P08 - 819	Yes, some fruits like bananas,		other things are....
	oranges.... all these you plant.	E02 - 850	Okay it is interesting to see the
E01 - 820	And they also make some		options for when the rains
	money..... (Laughing). Aah I		reduce..... none of these
	am sure you are seeing that what		options has to do with water.
	we are trying to do is to look at	E01 - 851	Yes
	instead of just thinking you are	E02 - 852	That is what surprises me I look
	going to cultivate this year, you		at that, so none of these options
	look at the way things are		explore water storage in digging
	changing.... what ways am I		a pump.... aah....
	supposed to do what....?	E01 - 853	So, she was....
P00 - 821	to use	E02 - 854	Wells or just something
E01 - 822	aah so that the cups....	E01 - 855	For her she is saying that when
P09 - 823	Even when it does not rain		she looks at what we have put
			here they do not concern much

- the use of water.... there is no other way you have given to say how to use the water, how to do what with it.... maybe it is making a dam because the rains are poor so that the little you have you discover what to use it on....
- P08 - 856** Like these where they talked of gardening, they mentioned gardening.... when mentioning it the idea was that when we make gardens, the water we use is from....
- P09 - 857** Wells
- P08 - 858** The gardens like we have said, water come from the well like this one here
- E01 - 859** Okay
- P08 - 860** Yes
- E01 - 861** So, you are saying this garden is for what? For wells.....?
- P00 - 862** For wells
- E01 - 863** Okay.... but here we all heard the question to say what has surprised her is that what she has seen.....most of these are not affected by water to say maybe you will be using the to say that if the rains are poor.... The same little one.....you find a way to use it.... yes.... yes
- P12 - 864** Yes, people maybe are just scared of talking because in most cases the rains, especially me.... what passed me is....
- E01 - 865** Yes
- P12 - 866** It is just the money but the idea is that we have seen the whites farming at least even a 10 hector or 15 hectors with a centre pivot..... just a reasonable one to be watering. Because if you have a centre pivot, even if rains go, you can still be watering your crops, now not knowing where this lesson can help us according to our level looking at.....because you asked to say how you plan, our planning is mostly dependent on rains and if God does not allow the rains to come, then even the cups will be disturbed.....but there are other friends of ours whereby even if rains do not come or it doesn't
- rain well....they still harvest because of using irrigation.
- E01 - 867** Okay
- P12 - 868** So, when rains are a problem the other idea is that.... how do we reserve that water from the rains so that it does not just get wasted; instead we build a place for that water so that we can be using it just the way we use it for maize.
- E01 - 869** Okay, his explanation is that depending on the levels.... but I have seen that others may have these irrigation systems but the challenge is that even we would maybe desire to have, we may want to do the same.....but the problem is water storage facilities. But he said that is common in other farms maybe a big farmer.
- E02 - 870** Okay
- E01 - 871** Yes
- P13 - 872** I wanted to comment on something....
- E01 - 873** Okay
- P13 - 874** I don't know if I am allowed?
- E01 - 875** Okay, go ahead
- P13 - 876** Okay maybe to help **E02** maybe on the part of these people...
- E01 - 877** Yes
- P13 - 878** The main focus like for the farmers is that they want food and then on the other aspect they want capital or money, that's food and money.... and for them to find those things, they look up to the rains.... so, all these under-listed items.....for them the main focus is capital or cash, not to have money because there is rainfall, no, but now since there are no rains what should give us cash and we can opt to those listed things.
- E01 - 879** Okay so through that they can have money.
- P13 - 880** Yes
- P08 - 881** Yes, because rains are not more or maybe resources to say now where are we going to find food, how are we going to survive.... so those things that have been listed there can help.
- E01 - 882** Oho okay, that is good.

P13 - 883 But without any kind of relationship to the rains, no.

P08 - 884 Yes

E01 - 885 He is saying that maybe the focus is not mainly to say maybe how the water can be used, it is more to the livelihood to say okay since there is no rain, how do we get money to buy food?

E02 - 886 Okay

E01 - 887 Which options are we.....so he said maybe the discussion is mainly coming from that angle than from this.

E02 - 888 Okay

E01 - 889 Okay now maybe we go to.... because even here like the way life is becoming difficult.... okay life is becoming difficult because you said that things are....

P00 - 890 Tough

E01 - 891 Maybe things are cheap here

P00 - 892 No

E01 - 893 Maybe they are expensive, then also diseases are continuing.... now how are we going to survive because let us not forget that we need to make sure that the cups are....

P00 - 894 Full

E01 - 895 Yes

P08 - 896 That is where families break or separate

E01 - 897 Yes, now are you saying the option is for the family to break or separate?

P00 - 898 *laughed*

E01 - 899 There was a comment that the hardships here actually have caused the break down in the extended families because of the social economic hardships.

E02 - 900 Okay

E01 - 901 Okay what of the options now.... what options can we use?

P08 - 902 Is it food which we are talking about here and life?

P10 - 903 No, livelihood

P08 - 904 That is livelihood now

E01 - 905 Yes, that is livelihood, now the problem here..... yes, it is livelihood but livelihood is also hard.

P00 - 906 Yes

E01 - 907 Yes, life is hard, then now how are we going to survive?

P09 - 908 How do we prepare since life is hard?

E01 - 909 Yes, how do we prepare?

P08 - 910 Mother to Ben, no kapenta that side

P09 - 911 life is hard,

E01 - 912 yes

P09 - 913 the best is family planning

E01 - 914 Family planning?

P09 - 915 Yes, to reduce instead of producing continuously....no I think we need to be careful

P08 - 916 Also, no polygamy

P09 - 917 Yes, even polygamy.....nothing

E01 - 918 Okay, no polygamy

P09 - 919 No polygamy

P08 - 920 Also, no unnecessary drinking of beer

P01 - 921 But you mostly forget about that.

P08 - 922 But when things are tough, we also stop

E01 - 923 Okay what else are we supposed to do when life is.....

P00 - 924 Hard

E01 - 925 Yes

P12 - 926 Change eating habits

E01 - 927 Okay changing eating habits?

P12 - 928 Yes

E01 - 929 Explain

P08 - 930 Yes, if you used to eat 4 times a day then you must change and start eating 2 times a day

P10 - 931 Yes, we cut off some meals not where you eat so many times just in the morning, no.

P08 - 932 there is no room to breath

E01 - 933 Now.... okay that's fine

P09 - 934 There are so many ways we can change the eating habits and it is not eating until your stomach is full.

E01 - 935 Okay maybe we can continue

P08 - 936 Maybe just on this one, also..... we don't need puppets whereby someone is just home and not doing anything while friends are busy looking for food. So, no one should just be home waiting for friends to look for food.

P09 - 937 No dependents.

P08 - 938 Yes, no dependents, no. Everyone should work, you must all meet at work.

E01 - 939 Okay so everyone has to work

P00 - 940 Yes

P09 - 941 Yes, everyone has to be involved
P08 - 942 No one should just be waiting to say they will bring food..... but what of you?
P09 - 943 No passengers
P07 - 944 I alone making plans for big people, no, at least I make plans for the children
P08 - 945 That's working if you are making plans to say go and dig basins right now and everyone goes to dig meaning the plan is from you. But some refuse
P07 - 946 You chase them
P08 - 947 Yes, a lazy person should not eat
P12 - 948 I will start chasing their children
P07 - 949 So now here you are saying everyone?
E01 - 950 Yes
P00 - 951 No dependents
E01 - 952 No
P00 - 953 Yes, in the morning everyone should go to the field because life is hard.
P12 - 954 Okay
E01 - 955 I think everyone was supposed to be here so that they can hear it for themselves.
P07 - 956 That's what we were talking about.
P08 - 957 Yes, instead of them remaining home, they should hear it for themselves
P07 - 958 Okay so changing eating habits
E01 - 959 Yes, not where by you cook a big nshima, no.... or cooking anyhow.
P09 - 960 Okay, no cooking anyhow?
E01 - 961 No, there should be a time table
P09 - 962 So, it is part of the eating habits
E01 - 963 Yes!
P0M - 964 Actually, we do change when we reach that time when things are tough.... we usually tell them to say no pounding samp now because samp makes maize finish fast.... so, we just eat unpounded maize and then we even drink water and that's all because our target is to reach the goal because it has become hard.
P12 - 965 Okay
E01 - 966

P08 - 967 Those who are not strong.... just like that
P01 - 968 We who are not used to staying without nshima...
P12 - 969 No-one should be lazy.... we are doing this because we don't want anyone to die.
P09 - 970 Everyone to survive
P12 - 971 What we don't want is anyone to die
E01 - 972 Yes.... okay now we want to go back there we looked at to say..... how do these things affect our cups? Aah.....get the manila.... put one just there
973 **E04 and E05 putting manila paper while some P00 are whispering in the background.**
E01 - 974 Yes.... then....
E03 - 975 The cups?
E01 - 976 Yes.....
P08 - 977 They don't want me to....
E01 - 978 Then this side on the cups.....we had cups for what?
P09 - 979 For cash
E01 - 980 Then.....and food
P12 - 981 Livestock
E01 - 982 Livestock
P12 - 983 Land
E01 - 984 Land
P0X - 985 Input
E01 - 986 Food produced then there is food available, right?
P0X - 987 Yes
E01 - 988 Food available
P08 - 989 And water
E01 - 990 Food produced.... then there is what.... there is water, that's alright?
P0X - 991 Inputs
P0X - 992 What about land?
P08 - 993 Land..... did you write it?
P06 - 994 Inputs have been left out
E01 - 995 What.... inputs.... okay.... okay, just put a cup on each of these headings (on livestock, land, food available, food produced, water and inputs) then you put.... did you get pins?
E02 - 996 Yes
E01 - 997 Then you pour water in the jug.... you.....let us try if it can help us so that.... because some lessons are difficult to explain but if we use practical examples, we can move at the same level.

Yes.....aah now here we want to look at each option.....these options we have given here, we look at how they affect what.....aah how they affect these cups, if we look at this livestock; there are no rains, the way you were explaining on the issues of what? Cash..... will it help to have cash or it won't help? Did you get my question?

P00 - 998 Yes

E01 - 999 Yes.... let us respond

P00 - 1000 It will help

E01 - 1001 It will help. If it will help then we will put a green pin

P06 - 1002 Repeat the question I didn't get it

E01 - 1003 Okay.....aah.... our idea or target is that the cups that side should be doing what?

P0X - 1004 Yes

E01 - 1005 They should be increasing even though the rains are what?

P00 - 1006 are not enough

E01 - 1007 Even if it is not raining now here is a person who has used livestock to say maybe one option I am going to use so that my cup for cash can improve..... I will use livestock.

P0X - 1008 selling

E01 - 1009 You have seen, right?

P00 - 1010 Yes

E01 - 1011 So that's the question to say when you consider these, you will be telling me to say or maybe you will be putting to say, if I do this one.... gardening.

P0X - 1012 That side

E01 - 1013 Where is it going? Will it empty the cup for cash or maybe it can also add here...? maybe it can add on the cup for food.... here also maybe it can add and also there... yes where it won't add, maybe this one here won't do what?

P0X - 1014 It won't add

E01 - 1015 It doesn't add

P12 - 1016 It has no effect at all

E01 - 1017 Yes.... so now it is to look at... it is not looking at maybe this year, or maybe... no long-term.

P00 - 1018 In future

E01 - 1019 Yes, to say if we do these in future it will help us so that even children will find to say....

P09 - 1020 Benefit

E01 - 1021 At least to say where our parents left us.....it is okay.

P0X - 1022 Yes

E01 - 1023 Okay.... okay.... yes, have we heard on that one?

P0X - 1024 Yes, we have heard

E01 - 1025 Now let us set for example like livestock

P0X - 1026 Yes

E01 - 1027 Livestock.....what are we saying on the issue of cash? Livestock on this cup for cash?

P0X - 1028 Yes

E01 - 1029 Yes, does it help?

P0X - 1030 Yes

E01 - 1031 Okay.... mmhfff.... **E02** these might be few

E02 - 1032 I'll keep looking for more

E01 - 1033 Ooh okay.....so now we will choose. Okay so this livestock

P0X - 1034 Yes

E01 - 1035 Then what about on food available? You said livestock.... you do what? The old woman said you sell then you do what.....?

P0X - 1036 You buy food

E01 - 1037 So now when you sell....

P0X - 1038 You buy food.... a bag of mealie-meal

E01 - 1039 Okay meaning that even here it adds a bit.

P0X - 1040 Okay

E01 - 1041 Then what about on the cups for livestock?

P12 - 1042 it reduces

and

P01

E01 - 1043 It does what?

P00 - 1044 It reduces..... aah.... maybe it will not.... but it will do what?

E01 - 1045 Then what about on land?

P08 - 1046 It reduces

P09 - 1047 No

E01 - 1048 On land, cultivated area...soil fertility

P08 - 1049 It will reduce

P01 - 1050 using?

E01 - 1051 Yes

P00 - 1052 It will reduce

E01 - 1053 It will reduce

P00 - 1054 Yes

P10 - 1055 How is it going to reduce?
P08 - 1056 The way it will reduce on....
E01 - 1057 But now.... wait, wait where is the recorder? Yes....
P01 - 1058 It will reduce on land, even though there is no rain; it is little but the zeal to cultivate may be there but then if we sell a cow, if rains come even a little we sell the cow.... maybe I have two; I will remain with one, meaning that I reduce on land.
P10 - 1059 Yes, the cattle will reduce and also that side
P01 - 1060 Meaning I will not cultivate what.....
P12 - 1061 On land
P01 - 1062 Ooh we are on land.
P06 - 1063 She is talking of the pair
P01 - 1064 A pair
P00 - 1065 She has rushed to the pair
E01 - 1066 No, we are saying because land.... those same pictures you have, we were looking at to say the cultivated area, then looking at the fertility.... yes.... so, all these are the stock for what? our land
P0X - 1067 It will reduce
and
P01
P08 - 1068 What reduces there like they have said..... you can only cultivate a small area, two because we also consider manure, maybe you had only two, and you remain with one.....the manure also will reduce which you were supposed to take to gardening.... it has reduced. And if you want to cultivate, you will only do a small portion. You had two....and when we are selling, we sell to have a large profit and so we don't sell a small one, instead we sell the very one that we like, the biggest.
P06 - 1069 So that you have a lot of money
P08 - 1070 Yes, so that we have a lot of money. The biggest is what we take to sell then you remain with small ones, which find it hard to pull the ADP.
E01 - 1071 *interpreting what P08 was explaining to E02.*

P00 - 1072 *whispering as they are waiting for E01 to continue*
E01 - 1073 So, it will reduce
P00 - 1074 Yes
E01 - 1075 So, you put for us.... no this is what we will do.....you will be given them and each one will be putting so that at least each one takes part. Yes, then.....what about others? Maybe there are others who were saying it cannot reduce so that they can also explain because it is possible that we can put two or even three there....it just goes with what.....explanation and also the way you are going to use.....there was someone who was saying it cannot reduce.
P0X - 1076 Because the rains are not there.....
E01 - 1077 Yes.... what.... what
P10 - 1078 The reason why we were saying.... because here we want to start from.... so that we have money.
E01 - 1079 Yes
P10 - 1080 But we have discovered that there is no other source that we can use which can make us divide, because when we sell cattle, we don't just sell for selling..... let one sell a cow so that they buy maize for food, no. sometimes we sell because we don't have money to buy food, how am I going to farm the coming year? So now when you sell a cow, you have cash and when you have cash – you buy food, after food you make a budget so that you farm..... when we talk of farming, we should know that maybe like we have said sometimes we do produce crops that do not need fertilizer, I can reduce to say this time...this side I will grow maybe it is sunflower, this side I will grow maize, so if there is a portion that requires fertilizer, and seed.... I will just buy seed. Yes, I will be minimizing so that the money can take me until the next farming term..... let us say for example, nowadays there is

- ripping, instead of me using convention, I will just use ripping, after ripping I will start planting alone with my family and also for food. Yes, that is where I was saying land cannot be affected much. Where a cow if for maybe K 7000 like P08 said that we sell the very big one so that maybe if I sell one..... unless if I have sold 2 or 3 – that's when I can make a loss..... you just consider the most important things to say, this K 1000 is going for food, this K 1000 is going..... or maybe it is K 5000 from K 7000. I take this K 5000 to the field, divide it; let K 3000 be used at the field, let me keep K 2000 so that I carter for other expenses like hiring labour meaning everything is catered for.... so, I see that there is no problem.
- E01 - 1081** Okay so meaning that we put..... this represents that no effect.... there is no
- E02 - 1082** Meaning you need to be careful
- E01 - 1083** Yes, yes..... yes so it means that you have seen others, say it can reduce.... others say it cannot reduce but you have to be careful to see that it is them who have helped, otherwise it will go where..... yes..... yes that is why we have put the yellow pin..... then what about.... what is the next one there?
- P0X - 1084** Food produced....
- P09 - 1085** Livestock, food produced
- E01 - 1086** When you sell, you sell livestock then.....
- P10 - 1087** You can cultivate..... yes you can cultivate and you can produce.
- E01 - 1088** Yes.... because see you sell what.....
- P0X - 1089** Cattle
- E01 - 1090** Cattle.....then how will your harvest be?
- P09 - 1091** It will be reduced.... you sell
- P11 - 1092** If you sell a cow, to say you are not in a problem
- P09 - 1093** Yes
- P11 - 1094** But if you sell a cow you can cultivate
- P09 - 1095** How can you cultivate? Explain....
- P11 - 1096** Through selling cattle....
- P09 - 1097** No, are you going to use cattle or hire?
- E01 - 1098** Hire
- P10 - 1099** Here, one I can use cattle, so now when someone decides to sell a cow, I don't put it that he has only one but can put it that maybe he has about 5 now among these 5 cows, I can look at there is one remaining alone every time in the kraal and now instead of it to be remaining alone or maybe the one that used to farm, I sell it...the other one will replace the other, so the pair will pair will not be disturbed so I can still manage to sell the other one. It is just the same as home. If I have maybe a car.....if the car is not bringing any money I can sell it and after I sell I will buy another one in future, so now I work hard to say everything at home stabilizes.... I say okay if I had a big car I would sell it and buy a small one so that I can be helping.....if it is a Toyota Noah – I buy we are just moving just like that.
- P09 - 1100** No, we are not looking at now but in future
- E01 - 1101** Yes.... okay
- 1102** *(The P00 talking in agreement with what P09 has said.....they are just speaking randomly almost at the same time)*
- P08 - 1103** They can finish
- P11 - 1104** You can sell even goats
- P10 - 1105** We are looking at where to start from
- P08 - 1106** Are we talking about in terms of reduced rain
- P09 - 1107** No, there is no rain
- P08 - 1108** No let us say there is just a little.
- P12 - 1109** Now since it is little....
- P08 - 1110** When it rains, and you have two pairs the reason why you have two is that you are trying to beat time that before the rains stop, I should be done... I should have already finished or planted already. Now if you sell one calf

and remain with only one pair, I don't think you will reach where you think two pairs can cover.... maybe for work I think it will force you to finish the same area..... now in finishing the same crops because you have said one cow, they will not reach..... not all of them will mature. Those that you plant late will do what.....they will remain because the rains would have gone, so the harvest will reduce.... it will reduce because you have just planted some crops... because you are told to say you need to plant, you were just thinking maybe it will come, maybe it will come; meanwhile it has gone but if you have two pairs within two days you can finish trying to beat time.....that is when maybe you can find profits, if you start selling anyhow meaning you will not see any profits

E01 - 1111 So, you..... you are saying that produced food will reduce?

P08 - 1112 But we are looking at what we started with this side

P10 - 1113 Meaning we are not supposed to sell, right?

P08 - 1114 What?

P10 - 1115 Meaning we are not supposed to sell

E01 - 1116 Yes.... because

P08 - 1117 because selling you can sell but our aim is to have more.

E01 - 1118 because it's a long-term process to say.....or what of.....but we are not saying your answer is wrong no because unless you have 5 pairs of oxen just like the example you gave.

P08 - 1119 yes

E01 - 1120 maybe you get some livestock here but still you manage to plough your hectares because of selling wisely. Not whereby you have only one pair of oxen or two then you get some oxen and sell. That's were others are saying no because you will not reach you target.

P08 - 1121 but also, let's not forget the way our lives are, if you have 4 pairs of oxen meaning I will not be the

only one to use them at home but we will be many who will use them. So, I get some oxen and sell meaning that I have disturbed that pair of oxen which my family use and that's why I came up with 4 pairs of oxen, so that everyone can do the cultivation in time.

E01 - 1122 okay so that you do the cultivation fast.

P08 - 1123 yes

E01 - 1124 okay, yah. Now at the same time let's remember that we are considering the future. So, this is almost the rule to say even our children benefits, we shouldn't just look at it just for today.

P08 - 1125 yes

E01 - 1126 yes, we should be able to say this one should not be sold anyhow, so that it's about the future, to say are the cups going to be full when you use that route or option.

P08 - 1127 but now when you sell one cow, you may find that maybe another cow will die of diseases meaning you have lost two cows.

P00 - 1128 laughed and arguing

P12 - 1129 now look at what we were discussing earlier, we looked at the environment, the way we are leaving now, after that we looked at the rains that its reducing.

E01 - 1130 yes continue

P12 - 1131 now when we look at the way the rains are reducing and we should look at what can help us so that our cups are full. You find that what you have is what you use at that particular time and then after that we get this idea now and take it into a long term.

E01 - 1132 okay

P12 - 1133 so that the way the rains are reducing and we continue with the habit of selling cattle, its true when you keep the money nicely it will be more, then this is what food?

E01 - 1134 produced

P12 - 1135 yes, even food can be bought

E01 - 1136 so, meaning the cup for livestock reduces

P12 - 1137 yes, it reduces. On land that's where there was a problem.

E01 - 1138 okay

P12 - 1139 If you don't use manure, it remains the way it is and now if you are selling animals which are supposed to give you manure then there will be an effect. Now when we come to the food we produce

E01 - 1140 you produce, which you take to food reserve agency?

P12 - 1141 mostly even taking to food reserve agency we use the same oxen and when oxen reduces meaning food produced also will reduce in future.

E01 - 1142 okay

P12 - 1143 because usually the hectare depends on the number of pairs of oxen you have as others said. So, as we go on and we get this idea even the children will know to say if you are just selling cattle and you are not planning at last you will stop cultivating because oxen will finish, so and... sorry food production will reduce hence making the cup half.

P08 - 1144 and the habit of selling cattle whereby even the children are seeing.... they will see to say our father has sold a cow and also their time will come to be doing so. And they will say our father used to sell so we can also sell. So, all things are finishing and at the end of the day there will be nothing left for those who are still alive.

P09 - 1145 actually, when we look at cattle, it's a bank for us with an open check, so cattle can be sold at any time when you have a problem. Now looking at that, when I sell a cow or big oxen, I should strive for a replacement. Its better I sell big oxen and buy a small female cow and the remaining money I use it on something I would need while I replacement is growing and start reproducing. I cannot just sell without replacing because that big ox can manage to buy one small cow and then I use the other money for something else. By so doing at least my livestock will keep on increasing because that's the future and we are looking at the future because if cows finish..... some of us we don't have bank accounts. Our bank accounts are the cow you have, so that's why I say when I sell I should have a vision of how to replace it.

E01 - 1146 okay

P08 - 1147 even if there is hunger?

P09 - 1148 yes, even if there is hunger but I will survive

P00 - 1149 arguing

E01 - 1150 so, you are saying that it should remain the same?

P09 - 1151 yes, it should remain the same.

E01 - 1152 so, meaning on livestock you can put this one

E04 - 1153 I put it?

E01 - 1154 yes. So, the lesson we are learning here is that when you sell you should be able to know that you need to replace using part of the money from the livestock you sold.

P00 - 1155 yes

E01 - 1156 so that you can buy a small cow.

P09 - 1157 yes

E01 - 1158 knowing that you sold big oxen, you then use some of the money and also use the other one to buy. Okay. Now there on water... the rains... any effect caused by selling cattle or livestock in the long term or is any connection with rains when you sell an ox?

P08 - 1159 doing what?

E01 - 1160 there is water, right?

P08 - 1161 yes

P00 - 1162 there is no connection

E01 - 1163 as you can see here, there is water.

P09 - 1164 there is no water to drink

E01 - 1165 yes, but now we are asking to say when you sell a cow, the idea of selling cattle doesn't it have an effect on the rains in future?

P08 - 1166 when you sell a cow?

E01 - 1167 yes, is there any connection or there is no connection?

P10 - 1168 the connection is there because when we were discussing, the big man said when you sell, you

must be careful so that you replace what you have sold. Replacing is difficulty and he said unless exchanging you bring in a small one so that you are even given some money on top of that which you use that money for other things. And now why they are doing that is because rain is changing anyhow, and sometimes it happens that rains are good but you don't have what to use. When you are just selling anyhow they will finish and when you don't have oxen even if the rains are good nothing will happen. Now the way we are living..... when rains are a problem and we finish selling all the cattle meaning the children will not have cattle because we are talking about long term. So, there is an effect

E01 - 1169 now you are saying that if rain becomes good in future...

P10 - 1170 yes

E01 - 1171 now is it because you sold the cattle that's why it's good?

P10 - 1172 no, not like that

E01 - 1173 now that's the question am asking

P0M - 1174 okay there is no connection.

E01 - 1175 there is no connection?

E01 - 1176 if there is no connection then we are not putting any pin

P0M - 1177 yes

E01 - 1178 now on inputs, in future are you going to manage to be buying inputs when you sell a cow, buying implements like ploughs, cultivator and hoes in the long term?

P08 - 1179 now meaning they have finished

P10 - 1180 laughing

E01 - 1181 what lesson can you give to your children so that they don't suffer in short? Yes, our mothers there on the issue of cattle you are not talking. What can happen to the implements when you use the option of selling cattle?

P08 - 1182 when.....

E01 - 1183 do the implements increase at home or they reduce?

P04 - 1184 they reduce

E01 - 1185 they reduce?

P04 - 1186 yes

E01 - 1187 okay can you put..... reducing it's a red pin, right?

P00 - 1188 yes

E01 - 1189 just put **E04** for the sake of time...yes you explain..... no inputs that side

P09 - 1190 at the last

E02 - 1191 red?

E01 - 1192 she said that the inputs will reduce

E02 - 1193 okay

E01 - 1194 the red pin is for reducing

P05 - 1195 what did you ask?

E01 - 1196 Yes, because you said they will reduce

P05 - 1197 if you are selling cattle every year or what?

E01 - 1198 if you use the option of selling cattle to find money, now this selling of this cattle in future will it help you that your children or your grandchildren will have a lot of implements at home or they will reduce?

P05 - 1199 they will reduce because you would have finished all the cattle through selling

E01 - 1200 okay

P05 - 1201 yes

E01 - 1202 alright maybe there is another one who wants to add?

P08 - 1203 they will reduce because those cattle... if you cultivate...

E01 - 1204 Yes

P08 - 1205 If you have cattle and then you start selling them.... You are supposed to buy inputs but if you start selling them away, meaning that farming will reduce hence not managing buying a lot of inputs this side.

E01 - 1206 so, you are saying that the production is affected then even the inputs

P08 - 1207 it reduces

E01 - 1208 they reduce

P08 - 1209 yes

E01 - 1210 okay in the long run

P08 - 1211 yes

P09 - 1212 I cannot connect the cattle to the inputs.

E01 - 1213 he is saying cattle.... we shouldn't connect them to inputs

E02 - 1214 okay

P09 - 1215 there is no link between the inputs and cattle. I can't accept because it is better buying inputs using cash crops like cotton or any other crop that can give me room to buy a plough than selling a cow so that you buy a plough.

P08 - 1216 no no...

E01 - 1217 no

P08 - 1218 what we are saying is that if you have many pairs.....

P09 - 1219 four

P08 - 1220 or two then in producing a lot you buy a lot of inputs through two pairs of oxen

P09 - 1221 okay

P08 - 1222 then if you only have one pair, then the inputs will reduce because this side they would have..... Because the other pair is sold if you only have one now

P09 - 1223 okay

P08 - 1224 not getting the actual cattle to buy inputs

P09 - 1225 okay in that sense, it is fine. You can help yourself but what is difficult is that the question is considering that there are no enough rains.... Now the rain is not enough and then you buy inputs wont it be a *white elephant*?

E01 - 1226 no, because maybe it does rain in bits then you are found you are not.... because it's about future plans, so you....

P12 - 1227 not prepared

E01 - 1228 yes, you can't tell

P09 - 1229 I can sell then I buy if I don't have

P12 - 1230 no, we see cattle being affected this side, what about inputs in future what will happen?

E01 - 1231 yes, the cup for inputs will it increase or reduce?

P12 - 1232 the cup for inputs will reduce because of the reason we have been talking about that if you have two pairs of oxen obviously. Maybe your target was 6*50kg of seed then when you have remained with two pairs meaning that the target of 6*50kg of seed will reduce because you don't have what to use to plant, you only have two pairs of oxen which not adequately enough.

P09 - 1233 they have reduced

P12 - 1234 so even the inputs will reduce because....

P09 - 1235 because the pairs have reduced

P12 - 1236 the pairs have reduced

E01 - 1237 okay... okay.... mmmmmm.... Yes.

P05 - 1238 again, the other way... if the pairs of oxen have reduced, it's to try another type of cultivating than just relying on pairs of oxen, because they also teach us retention basins..... if you see that the pairs have reduced, it is to make or dig basins and basins help a lot in times of poor rainfall. That's what they teach us that in times of little rainfall use retention basins.

E01 - 1239 okay

P05 - 1240 meaning you have helped yourself.....

E01 - 1241 (*E01 explaining to E02 what she was saying, the voice too faint...*) so... aaaaaa what she is talking about is that if the other side you are stuck, you need to find another way of doing what.....

P00 - 1242 farming

E01 - 1243 of going back and she is giving an option that instead of relying on cattle for her it is better to start doing what..... digging basins so that maybe my cup doesn't do what... don't completely go dry

P00 - 1244 yes

E01 - 1245 maybe also basins can help you in what.....?

P12 - 1246 maintaining the cup for inputs

E01 - 1247 eeh.... Yes

E04 - 1248 so, should we put the green one?

E01 - 1249 what she has said, it is a step?

E04 - 1250 okay, it's a step

E01 - 1251 what is needed to put into consideration which is almost our last part which we are..... because at least we were supposed to say now what is that we are to what.....

P12 - 1252 do

E01 - 1253 because the lesson we have found here is that there are different ways or options, now

these options do affect the cup for.....

P12 - 1254 cups are different?

E01 - 1255 yes, they are different

P12 - 1256 other cups are affected and other remain an affected

E01 - 1257 yes, meaning that we don't need to be selling anyhow but we should always put it in mind that if I do this and that, what will happen to the cups.

P12 - 1258 That here and there

E01 - 1259 so that you look to say, I think this one yes, I will have thousands in future

P12 - 1260 I will be negatively affected in future

E01 - 1261 in that cup, so that you start doing what they have been explaining to say you start in advance that here friends lets us have a small portion, let us do this or that.... yes.... are we together mothers?

P00 - 1262 yes

P12 - 1263 just an addition on this one, the issues were people concerns our lives, now my puzzle currently is that should I sell maize in the field or ox... you have seen.....

E01 - 1264 yes

P12 - 1265 so, through this debate and said let's discuss, others say no that's why we grow the maize for selling so let's just sell even though they are still in the field so that we can solve some problems, the cow maybe will not find chance to do what.....

P00 - 1266 buying another one

P12 - 1267 buying another one meaning that the production..... it will be difficult for us to do what.....

P0X - 1268 cultivating

P12 - 1269 thinking deeply, to say what am I going to do here in future will it make me comfortable or uncomfortable because life is difficulty.

E01 - 1270 yes

P12 - 1271 so, as we are looking at these cups we really need to be careful not looking into one cup..... you need to look at each and every cup.

E01 - 1272 what he is saying is that before making a decision you need to look at multiple cups. That's one lesson he is emphasizing.

P12 - 1273 yes

E01 - 1274 okay..... so.... This side how far is the food to be ready?

E02 - 1275 are you speaking tonga to me?

E01 - 1276 no no no..... **E01** and **E02** busts I laughter.....so let's do this..... what is supposed to be done?

E02 - 1277 I have an idea

E01 - 1278 okay

E02 - 1279 are you thinking of how to write these...?

E01 - 1280 The activities

E02 - 1281 yaah

E01 - 1282 yes

E02 - 1283 I have an idea

E01 - 1284 so.... aar.... I believe we have seen that the most important lesson as he has explained to say no before we do anything we need to take a serious consideration to say what I want to do how will these cups going to be affected? Will it help me that in future? I need a comfortable life or maybe I even become more stack than the problem I'm facing right now.

P00 - 1285 whispering to each other.....

E01 - 1286 Yes... yaah.....so... aar....so that's why it has influenced us to say in this situation, what.... what ways or steps or maybe I say what are we supposed to do exactly that from this workshop for me it's this so that if things happen like this I will do this and that... one example given she said.....

P08 - 1287 digging basins

E01 - 1288 digging basins to say.... yes, there are animal diseases maybe they also finish, by that time maybe the knowledge of digging basins is not what.....

P00 - 1289 not there

E01 - 1290 is not there, the children don't do what.....

P00 - 1291 They don't do them

E01 - 1292 they don't do the basins then the problem hits them. Now we should consider when we are

digging basins that we are not just digging to say maybe it's for a short-term no. where we are going maybe the same plot is the one that will do what.....

P00 - 1293 help
E01 - 1294 that will redeem us..... start again, what else?

P00 - 1295 whispering to each other
E01 - 1296 yaar..... the steps are.....
E02 - 1297 You write
E01 - 1298 Ooohhh..... Okay.... aaah..... now what else should we do so that when you sell you are not affecting those.....

P12 - 1299 re stocking
E01 - 1300 Re stocking
P12 - 1301 that's it
E01 - 1302 okay.... so, you bare saying restocking helps the cup not to do what?
P09 - 1303 that it is not affected

and
P12

E01 - 1304 should not reduce
P12 - 1305 Yes
E01 - 1306 okay.....
P00 - 1307 whispering to each other
E01 - 1308 maybe let me ask in this way....
P00 - 1309 yes
E01 - 1310 aah.... For you to ask that option, so that you use this way, that side there is a problem of rain so that you use that way what are you supposed to do now? Are we together?

P00 - 1311 yes
E01 - 1312 so that..... we are looking at selling...

P00 - 1313 cattle
E01 - 1314 cattle. So that in future I use this method

P00 - 1315 selling cattle
E01 - 1316 yes, what am I to do now?
P12 - 1317 taking care of your cattle.
E01 - 1318 taking care of your cattle?
P09 - 1319 cattle management
E01 - 1320 I have rephrased the question... aaar... now on that one, exactly what are you saying? Proper management.... we need direct and clear points so that when we are out this workshop I know to say know these in future I will touch here, I want to use this option or step because of

this..... you can use it if you don't have what?

P00 - 1321 cattle
E01 - 1322 Cattle or livestock
P09 - 1323 you rip in advance
E01 - 1324 you are supposed to.... You have said proper management.... what?

P12 - 1325 dipping
E01 - 1326 okay
P09 - 1327 dipping
E01 - 1328 dipping. What else?
P12 - 1329 that one they call dosing
P09 - 1330 dosing
P12 - 1331 giving them medicine
P09 - 1332 yes, that's dosing
E01 - 1333 what if you don't have. What do you have to do in order to use that step?
P12 - 1334 you acquire them.
E01 - 1335 but how? how do you acquire them?

P00 - 1336 laughing and whispering to each other
E01 - 1337 yes
P10 - 1338 it's to go and ask **P09**
E01 - 1339 okay one step is to ask
P00 - 1340 yes
P09 - 1341 asking
E01 - 1342 okay
P06 - 1343 yes, the way they are expensive, we usually see them
P02 - 1344 they can only give you maybe 1ml
E01 - 1345 yes
P05 - 1346 if you have maybe 6 you need to sell one so that it cures the other 5.
E01 - 1347 okay
P05 - 1348 like cattle, if you have six because maybe you don't have money and you have seen that all of them seem to be weak, they are all about to get sick, you sell one so that the money is used to buy medicine to cure others.

E01 - 1349 ohh... okay
P05 - 1350 yes
P08 - 1351 this lesson is difficulty
P00 - 1352 whispering....
E01 - 1353 okay... eeeh I was thinking like this because these future minds...

P00 - 1354 yes
E01 - 1355 we have looked at to say as things are getting more difficulty

and we don't have even a chicken. Meaning, that I should find a way so that.... even these livestock don't just help in short term but also in future. Meaning if I'm to do a piecework let me do it and after that I do what.... I should buy because that's my starting point. Maybe I start with chickens, from there maybe I reach an extent of buying a goat, until reach at the point of buying what?

P00 - 1356 cattle
E01 - 1357 meaning in future, 5 to 10 years me who had nothing, it's me who will be saying how many are they?

P00 - 1358 I have 4
E01 - 1359 yes
P00 - 1360 yes
P12 - 1361 buying
E01 - 1362 so, you have seen, otherwise life is changing

P00 - 1363 yes
E01 - 1364 what about us, are we preparing, we are talking about option of selling cattle, now do we have?

P00 - 1365 we don't have
E01 - 1366 yes, that's where we are saying, what is it that we should do so that we do what.....?

P00 - 1367 have them
E01 - 1368 we have them, so that our cups do not what?

P00 - 1369 reduce
E01 - 1370 they start improving
P00 - 1371 whispering in agreement with each other

P12 - 1372 because teacher you have started

E01 - 1373 have you heard the question?
P12 - 1374 in a situation that they are already there

E01 - 1375 ohh
P12 - 1376 yes
E01 - 1377 I think there was a misunderstanding

E02 - 1378 okay
E01 - 1379 they were taking the situation to say assuming they already have.

E02 - 1380 okay
P12 - 1381 yes
E01 - 1382 so
P12 - 1383 what if we don't have...me....

P09 - 1384 but we should say we don't have now

P12 - 1385 here starts the issue of charcoal
P09 - 1386 you buy cattle
P12 - 1387 when you sell charcoal, you keep the money

E01 - 1388 so... meaning that...that step... let's use the same step we see

P12 - 1389 yes
E01 - 1390 One is charcoal burning. The charcoal you do what?

P00 - 1391 you sell
E01 - 1392 then you sell to find cash
P12 - 1393 Money
P06 - 1394 you keep
E01 - 1395 you save
P00 - 1396 yes
E01 - 1397 okay, then?

P00 - 1398 when it's a lot you buy a cow
P09 - 1399 when it's a lot you buy a....
E01 - 1400 you buy a cow then?
P06 - 1401 if you are lucky that cow starts reproducing

P12 - 1402 now we come this side.
E01 - 1403 now it's just buying then it starts reproducing?

P00 - 1404 no. you take care of it, proper management.

E01 - 1405 you do what?
P00 - 1406 you manage it properly
P08 - 1407 looking after....
E01 - 1408 now you mention specifically because when you just say looking after.... What exactly is supposed to be done?

P06 - 1409 taking it out for grazing
P09 - 1410 taking it for grazing is to do what?

P08 - 1411 dipping
E01 - 1412 dipping
P09 - 1413 dipping
E01 - 1414 dipping yes, what else?
P09 - 1415 dipping and de-worming
E01 - 1416 de-worming okay.... so that I think you have seen that for you to reach the extent of what?

P08 - 1417 you start working
E01 - 1418 you are using that step or way we were saying that in times of difficulties, you can do what.... You can sell.

P00 - 1419 yes
E01 - 1420 now what is supposed to be done so that in future we find ourselves in a position that we

have were to touch? on cattle.
You can do what?

P08 - 1421 you can pull through
E01 - 1422 meaning that one way is charcoal burning but then charcoals goes to what.... to money, the money you can save, then from saving you can buy after which you start doing what... it's not just taking the animals for grazing but there is de-worming, dipping

P12 - 1423 so that it reproduces
E01 - 1424 oohh... so that it reproduces
P00 - 1425 yes
E01 - 1426 reproduce okay
P00 - 1427 then you are rich
E01 - 1428 oohh... then you are rich
P00 - 1429 yes
P09 - 1430 that a long time
E01 - 1431 so, you have seen that it's a long time
P00 - 1432 yes
E01 - 1433 now for you reach at a point where the cup is full, you need to start when?

P00 - 1434 today
E01 - 1435 exactly
P09 - 1436 so, you have seen this one, it has become a process and like teaching a child grade one, two, three

E01 - 1437 yes
P09 - 1438 for you to enjoy the money it's in future when he or she starts working

P08 - 1439 that's why he said that its preparing other people's future, you will just eat little from your child you might die, but you prepared him or her.

P09 - 1440 meanwhile he/she have been prepared for his life.
E01 - 1441 so, he is saying that this process takes long to benefit you, you will almost be dying.

P09 - 1442 his/her life would have been shaped already, so that's the process that we have learnt. Planting musangu trees the ones I used to refuse to say what is it for? So those that had agreed the planting of musangu have big trees in their fields.

P08 - 1443 if I plant now by the time they become big I would have died already
P09 - 1444 this process has helped us a lot
E01 - 1445 okay
P09 - 1446 to think critically when making a decision to say should I do this, there are questions you ask yourself before you do anything so that when you fail you will have no one else to blame but yourself. Thank you so very much for showing us. Because from charcoal we were thinking that it's impossible and now we know that from these small businesses a big thing can be born.

P12 - 1447 Another important thing
P09 - 1448 even some of our old fathers that's how they were becoming rich. These cattle.... He tells you a story to say I used to sell maybe tobacco or just something else and then he managed to have a cow but now we are going out of direction due to time that has changed.

E01 - 1449 yes
P09 - 1450 now again, it has changed pressing us to start going back to the old way of life so that we can be rich because now no one can say that he/she is not feeling the pinch. All of us are feeling the pinch, no one is exempted
E01 - 1451 is there any other route? You have seen that this just one way, right?

P00 - 1452 yes
E01 - 1453 we started from charcoal, is there any other routes we can do apart from this step so that.....

P09 - 1454 others said growing groundnuts
E01 - 1455 okay growing groundnuts
P09 - 1456 our sisters' groundnuts... from groundnuts they find a lot of money even a cow they can buy but they only buy clothes.

E01 - 1457 so, he is saying that these **P0W** through groundnuts you can start doing what? Building the cup so that in future you can have where to do what?

P00 - 1458 where you can touch

E01 - 1459 where to start from (touch)
meaning that you save then you buy.

P09 - 1460 then you buy a cow

E01 - 1461 okay

P05 - 1462 and also sewing

E01 - 1463 even sewing?

P00 - 1464 yes

E01 - 1465 ohh okay

P12 - 1466 anything

P09 - 1467 there are a lot of ways even selling flitters

P12 - 1468 yes, then you are saving

P09 - 1469 just from flitters you buy cattle

P12 - 1470 what is needed is just discipline with money.

P09 - 1471 yes, with money

E01 - 1472 yes, can you explain... he is saying that discipline of this... the money, here that they should be discipline

E02 - 1473 okay

P12 - 1474 just there on money, we see people who would start with charcoal, when you come back you look at your friends they are all drunk, the improvement is not there. Again, they burn charcoal until the tires for the bicycles are... the tires finishes. He is not...

P09 - 1475 he is not doing anything

P12 - 1476 doing anything

P06 - 1477 such that even buying a tire becomes difficulty.

P12 - 1478 even buying a tire becomes hard

E01 - 1479 okay

P12 - 1480 so, the most important idea is that when you are doing whatever you are doing you should be considerate of the future. 4 years from now.....

E01 - 1481 yes

P12 - 1482 where will I be?

E01 - 1483 yes

P12 - 1484 out of charcoal I can manage to have cattle in the paddock, all these cups to be full is the biggest idea

E01 - 1485 yes

P12 - 1486 not just buying... because there is selling without any reason of selling

P08 - 1487 out of charcoal you bring another wife they become two at home.

P12 - 1488 they become two

E01 - 1489 so, they are saying... giving examples of indiscipline

E02 - 1490 okay

E01 - 1491 that can arise

E02 - 1492 okay

E01 - 1493 Yes.... maybe there is something else.

P10 - 1494 that's where is there is a problem, to say we don't know who can fail to progress but there in one word that I have loved, maybe a question but I think I mention it the way I heard it.

E01 - 1495 yes

P10 - 1496 to say saving because we are talking about the future. just like if I grow groundnuts of course you can't grow them just one season, when you grow produce this year... let's say you raise k800, from this k800 there might be something that is supposed to be done then you say let me just get a k200. Yes, in older days they used to put in small canes but nowadays there is these big canes they call bank accounts, you bank the money in it just like they have said it discipline. Sometimes you face a problem and you know that there is some money you saved, now life becomes difficulty in the end you just decide to say let me go and withdraw because this I'm faced with is a problem too. This is where the word they have mentioned discipline comes into play. It's better to put a rule concerning your money to say when you get.... you need to feel as though you are owing and that you need to return it bearing in mind that this money..... if you get without returning it means that there is a gap. You need to be troubled not until you return it because what you are looking at is the future, now what happens is that people say since it's me who saved it I will start again saving next time but of which you cannot restart again. When you save make sure that the money you have saved...

you should forget about it. That's why our friends the whites you find that... some old men we used to see them even the P0W can agree with me that when they find money even when a child gets sick they would never get the money to use it. They used to fear and these old men we say that they have charm (they are wizards or witches) that they are something bringing money meanwhile there is nothing. They would rather go and get a credit from someone because they will be forced to return the money to that person meanwhile they have money within themselves. All they want is that the money saved should go for the intended target which is where?

P00 - 1497

P10 - 1498

the future even us that what we should do. For example, you save k10 every month by the time 4 years will pass, how much money will you have? You will just go to the bank saying I have money and you buy a cow. Others will just be surprised to say where did he found the money? What am seeing is that we are talking about long term plans.

P01 - 1499

yes, in addition to what he said, nowadays money is nothing if you don't have a plan. It's more like gambling where someone comes bets a k5 and in return he gets a k10, so many have become successful such that they even have houses through planning. Knowing to say today whom am I going to give... it bears interest in all the option here if you consider the future. What is important is planning and knowing how you are going to source the money so that you lead a comfortable life. Otherwise the options here are many as long as you know what to do. We do find money but we don't know how to use the money. We find money but we don't know where to put it. Are

the saving accounts... we don't know to say where do we save the money from but we only know saving money in the houses. This is dangerous because you are always near the money but if it is at the bank at least he feels lazy... sometimes we undermine ourselves to say I can't put a k5 I the bank it's too little meanwhile its money too. The little you save makes a difference, I think what is destroying us in our lives is... eer I think you will forgive me because we are just learning. Generally, we are talking about our lives as Zambians and it's that what your relative has or your brother you will also count that it's yours. If your sister has you will count to say it's yours too not knowing that also the government changed the policy and it says the parents and the children. Now that's what is opening us to say there is this rule and we know that when one dies you will not get anything because in the past they used to account to say it's mine. And that's why we are saying that time is changing; now you have come to open us because some of us were still behind.

P00 - 1500

E01 - 1501

P0W- 1502

P04 - 1503

yes maybe you have something to say that side?
talking the background not clear
yes, we have learnt something or personally I have learnt something. I have learnt a big lesson because I used to fail to save and I didn't know, if I find a k10 I used to fail to keep it. I used to be careless knowing that I will find another one not even knowing the ways I will use to find it. so, I have learnt a lesson to say when you find a little amount you should keep it and think of the future that I will use it later. And if not I use part of it and keep the other one. You continue working hard to find more. The most important lesson I have learnt is working hard and when

you do that you find that which you want and see the profit in future. Not whereby when you find something you misuse it because those who become rich.... they become rich even through selling fritters or selling cassava leaves. But some of us we want to say unless I find a 10 million that's when I will buy something of which you may not even find it. Its better we learn to say when you find a small amount you should keep it so that you use it in future.

E01 - 1504

P07 - 1505

yes, go ahead

also, just to add on I have understood this lesson its good and we have known to say when you are keeping money in your house... you should be keeping it so that you use it future because we were thinking that until find a 5 million that's when am going to take it to the bank and so that they keep it for me. Now I have heard that even when I find a k20, k50, or k400 I should take it so that they keep for me instead of keeping it in the house.

E01 - 1506

P10 - 1507

okay, now.....

the other thing I saw with us blacks is that we have so many plans, we plan a lot of things while having a little source of money. I can say.... Like we said maybe in a year a person may want to buy a bicycle, I need to buy a cow...

P09 - 1508

P10 - 1509

a motor bike

yes, even a motor bike, so now I need to make sure that my child marries, so all things will be plans for one year forgetting that all these things are big. That's what makes us fail because of wanting to do everything in a short period of time and you even fail to do even one thing because of wanting to do everything in a short time. That's what I saw, our friends the whites they say.... Just like the way we are learning to say 5 years' plan, they just say I think in future I need to have this

and this is a goal. Because us sometimes we don't have even a goal that's why we just say in a year if I see someone driving a vehicle then I will also think of buying a vehicle and tomorrow I see someone with a motor bike then I say no at kasumbalesa boarder they are saying its 1.5 million a motor bike. So, us blacks we don't think of how I should leave my life no, we always want to do what our friends are doing and getting plans from your friend. It's difficult to implement them. So that's what we are learning to say if you don't have a cow, then you think of having a cow first in future not... because I see even two are enough. If I want my children to go to school in future, I also should have more cattle such that even when I die the children should be okay and for us to have such plans we fail. Just to plan for 2 or 3 items we fail unless 20 items which we cannot even manage.

E01 - 1510

what of if we do this, when you look at the options, we try to compare these options because the most important thing in this lesson just as you have said it's to look at the future.

P10 - 1511

E01 - 1512

P00 - 1513

E01 - 1514

yes

but preparations should start....

today

yes, now the options we take... let's say two people, this one takes the option of groundnuts and this one takes the option for what...?

P00 - 1515

E01 - 1516

charcoal

now these two options, do they have effects on the cups? Do they have an effect on cash, food, livestock on and land? We have seen that they help so that we buy, right?

P00 - 1517

E01 - 1518

yes

yes, now what effects are there if you just look? When someone starts with charcoal and someone starts with groundnuts and these others start with

selling fish, then now these options how can they... let's say how can they affect the cup for land?... cultivating, inputs because the first lesson we saw to say these cups are connected so that we see to say... maybe livestock starts dying that is not.....

P00 - 1519 not needed

E01 - 1520 and when you look charcoal goes to livestock and someone starts with groundnuts and maybe this one starts with nesting, is there... when you look at these option is there a way they affect these cups in a way which we don't want or they are just okay these steps.

P0M - 1521 land?

E01 - 1522 even on land, there are inputs and food.

P09 - 1523 yes, they affect some them like groundnuts

E01 - 1524 okay groundnuts

P09 - 1525 groundnuts are legumes and when you plant them they have some fertility to the soil.

E01 - 1526 okay

P09 - 1527 so that when you plant another crop if its maize, your harvest will be good because they have nutrients to support the crops you planted. They make the soil fertile

E01 - 1528 okay

P09 - 1529 the same groundnuts we eat at home. They have nutrients needed by the body.

E01 - 1530 okay nutrition

P09 - 1531 yes, nutrition, they are nutritious. We sell and find cash, so it's in 3 ways. We then come to charcoal.

E01 - 1532 okay

P09 - 1533 charcoal.... We learn that number one.... when you burn your charcoal that ashes there it can destroy the land and crops cannot grow well.

E01 - 1534 okay

P09 - 1535 number 2 we said that water depends on trees

E01 - 1536 okay

P09 - 1537 if trees finish just know that you are creating a desert

P10 - 1538 there will be an effect on water

P09 - 1539 there will be an effect on.... But money on charcoal or let's say no sorry let's talk about the advantages. Charcoal when sold you can find cash and put in the cups, now where you get the charcoal from.....

E01 - 1540 no wait a bit, let's do this....

E04 - 1541 on those cups let's start with...

P09 - 1542 groundnuts

E01 - 1543 groundnuts, what happens to cash? Does it increase or....?

P09 - 1544 it increases

E04 - 1545 should it be full

P09 - 1546 yes

E01 - 1547 so, we are on this route, this one, then on the available food? then on the available food it increases

P09 - 1548 okay

E01 - 1549 it increases even here?

E04 - 1550 yes

P09 - 1551 okay

E04 - 1552 okay

E01 - 1553 okay, then of course on the livestock, we have already put it to say it's the route heading to that one

P01 - 1554 yes

E01 - 1555 then on land

P09 - 1556 it adds fertility

E01 - 1557 okay

E04 - 1558 okay

E01 - 1559 then the food produced?

P09 - 1560 it adds

E01 - 1561 it adds

P09 - 1562 yes

E01 - 1563 what of rain... on water?

P09 - 1564 groundnuts on water...no it doesn't

E01 - 1565 okay. What of on inputs?

P09 - 1566 it adds on inputs

P00 - 1567 it adds yes

E01 - 1568 okay now you have seen to say we were saying it adds where it does and that is the groundnuts step or option.

P00 - 1569 yes

E01 - 1570 now on these same cups let's use the route of charcoal.

P09 - 1571 yes

E01 - 1572 on cash

P09 - 1573 it adds on cash

E01 - 1574 it adds on cash

P09 - 1575 yes

P08 - 1576 more money in your pockets

E01 - 1577 okay put some more there

P09 - 1578 it increases the cash
E01 - 1579 then on the...
P09 - 1580 food
E01 - 1581 the available food.... charcoal...
P09 - 1582 it increases you can buy
E01 - 1583 okay
P01 - 1584 you sell and buy medicine for the livestock
E01 - 1585 then..... charcoal on livestock
P00 - 1586 it helps
E01 - 1587 it helps just the same, meaning even the on groundnuts....
P12 - 1588 put water even on groundnuts
E01 - 1589 put water also there on livestock it adds
P00 - 1590 yes
E01 - 1591 what of charcoal on the land?
P09 - 1592 no, it reduces
E01 - 1593 okay
P10 - 1594 don't put there
E01 - 1595 so, you don't put?
P00 - 1596 no
E01 - 1597 but on food produced?
P09 - 1598 it reduces
E01 - 1599 okay it reduces
P00 - 1600 Yes
E01 - 1601 what of the water.... on the rain?
P09 - 1602 it destroys. It reduces
P0M - 1603 it reduces
E01 - 1604 okay, on inputs?
P0M - 1605 it adds
E01 - 1606 it adds?
P09 - 1607 yes, if you think well
P0M - 1608 laughing
E01 - 1609 so, you have seen two steps but on the cups the other option in the long run.....
P0M - 1610 there is nothing that happens
E01 - 1611 there is nothing that happens?
P0M - 1612 yes
E01 - 1613 now, it's like the other one adds on.....
P0M - 1614 it adds on both
E01 - 1615 so now if it's choosing to say what will help in future, what can we choose?
P00 - 1616 growing groundnuts
E01 - 1617 groundnuts
P00 - 1618 yes
E01 - 1619 now if you use that option what are you supposed to do so that things of saying there it adds, there it doesn't so that we try to minimize that problem. What can we do on this option for charcoal because we have seen where it

adds and we have seen where it....
P00 - 1620 reduces
E01 - 1621 so, where it reduces that's where there is a problem and what can we do so that... because we are looking at the future in the coming days.
P09 - 1622 this one in future, we should stop it.
P00 - 1623 laughing
E01 - 1624 he is saying that in the long run we should stop that.
P09 - 1625 I have said that because if we continue with charcoal, even your healthy as a human being it reduces. You end up getting unhealthy and when you continue with charcoal you can't be physically fit for two consecutive years; the people will notice some change with your body but this one of growing groundnuts will be a healthy one and this time pull with our hands. There is no big labour and they are nutritious. So, for me I can say if you have a goal and you have no other source but you have a goal once you reach that goal you should stop.
E01 - 1626 okay, yes
P10 - 1627 the other thing is planting
E01 - 1628 planting...
P10 - 1629 trees
E01 - 1630 okay planting trees
P10 - 1631 yes, because when you cut and you plant again, it can be good but if you cut and you fail to plant them its better you just stop cutting them.
P09 - 1632 but in Zambia we fail to plant even just at home we fail to plant trees
E01 - 1633 okay
P09 - 1634 in Zambia life..... we don't plant
P12 - 1635 also, it's not that there on land... and on that one it's not that until all the trees finishes but we are just talking of this habit. It doesn't help on the land and that one
E01 - 1636 okay
P12 - 1637 so even if we plant trees and when they grow still you cut those trees to make charcoal and

then the land will not benefit also on that one, so the most important is to look for the options which can fill all the cups if it substitutes at the same time you substitute with something.

E01 - 1638 okay

P12 - 1639 yes

P08 - 1640 someone will plant quite alright but again someone will come and cut it still.

P00 - 1641 laughing

E01 - 1642 so now what are we supposed to do? The beginning is different, some there beginning is charcoal burning

P00 - 1643 yes

E01 - 1644 but we have seen to say that the charcoal option in future will bring a problem

P00 - 1645 yes

E01 - 1646 problems yes, what advice can you give because someone will tell you to say but this is my beginning and now as a **P00**, what are we supposed to do? Because even if you are cutting trees or not but when the problem comes, does it come to one person to say rains are.....

P00 - 1647 no

E01 - 1648 it....

P09 - 1649 yes, so meaning that problem in the near future it will not be only for one person but all of us. So, what are we supposed to do so that those who manage to say their beginning on this one. Now how can we help them so that we fight that, of course they have said planting trees. Now, what can we do so that we start planting trees? No don't talk in the background speak up.

P09 - 1650 don't start marking committees there.

P08 - 1651 speak up. Also, the other ways, this same person who is cutting down the trees, you just tell him to stop and try to show him another way of like.... maybe you show him the way or option of groundnuts to say use this method because this one you are in look in future you are not

the only one who wants to benefit but there are other people we are trying to pave way for. But if you continue meaning that your own children will do what.....?

P02 - 1652 they will suffer

P08 - 1653 they will suffer. So, this person is to tell him that no stop cutting down trees.

E01 - 1654 okay, then what of.... okay, maybe there is someone to add before we can speak?

P05 - 1655 the method of stopping them or us from cutting tree for charcoal burning meanwhile for us that's the stepping stone... you should first start by teaching us not just telling us to say stop you are destroying the soil or causing rainfall to be little because we will feel bad. But if you start by teaching us to say look number one is that your life is at risk by burning charcoal because charcoal burning brings diseases like TB, asthma and not only that but also by so doing the soil is destroyed. So, if you teach him/her they can probably stop after they have found some capital but just to tell them to stop there and then would be worsening the situation.

P00 - 1656 they busted in laughter

E01 - 1657 she is saying that charcoal is her starting point; just to stop them is not an option. What you need to do is to give us the reason and where to start from apart from charcoal burning.

E02 - 1658 okay

E01 - 1659 yes.....

P10 - 1660 the issue of charcoal, what I have seen..... according to what others are whispering here, it seems like charcoal burning and farming are almost becoming equal in Zambia because most of the people who are not involved in farming they are in charcoal burning. Now you will find that the chiefs write letters to the headmen telling them to say tell you people to stop cutting down trees, so ever wants to burn charcoal should first go to the

headman to ask for permission. The headman will ask for the reasons as to why that person wants to burn charcoal and mainly they will give good reasons like I want to take my child to school and with that reason no headman would say no. They allow and give a limit of trees that person should cut leaving a reasonable distance between trees. Others will also come with a reason to say I don't have food that one is also allowed to say okay you can burn so that you can buy food. So now you will find that everyone will be coming up with convincing reasons of which that might not be the core reason as to why they want to burn charcoal. What is difficulty for the headmen is that they can't really know to say the money is used according to the reason given by that particular person because they don't see the money. If one is allowed to say you can burn charcoal because of the reasons given to say I want school fees for my child, I want to buy food, but at the end the money goes somewhere else, so its difficulty to strictly stop them. As am talking right now there are rules that come last week from the chiefs which have to be ready to the people concerning the same trees. The rule is that if one is found cutting trees for charcoal it's the headmen who will be arrested. You see how things have changed now? If anyone is found cutting trees for charcoal, that person will be asked from which village he comes from and they will arrest who?

P00 - 1661 the headman of that particular mentioned village

P10 - 1662 the chiefs will say we gave the headmen the rules. What has caused this is because people have taken advantage that this is the easiest way of making money. Everyone is rushing into charcoal burning now just like my

mother has said, if it was possible to have the whole team to visit so that they look at this issue of planting trees and tell us to meet at a central place to teach us how to go about planting of trees to say this how to plant and then give us nursery to go and plant. Now if you just tell us to say go and plant meaning we will just be planting mangoes, strawberries which can't be cut, that's the problem. It's better to give us knowledge. As you have seen here we are looking at what...?

P00 - 1663 the future

P10 - 1664 the future. Meanwhile they are just quiet while the trees are finishing in the end the land will become a desert.

P00 - 1665 yes

E01 - 1666 okay then now..... aah we believe that it is same as you start little by little. It's like from grade one.... the lessons continue

P00 - 1667 yes

E01 - 1668 now we have reached at a stage..... seeing that these things involve you and your families. Others involve all the people. The government has a part to play on your social economic life and also the rains under environment, the trees are found where?

P00 - 1669 on the environment surrounding us.

E01 - 1670 the area we live in (environment).... so, you have seen that no one else will come to improve our lives but ourselves. So now... aah our idea was to look at now that things are becoming hard, what is it that should be done, there are a lot of thing that can be done. Then we also said that after looking at what we can do let's look at the ways or steps that we chose.... what effect does each have on the cups so that we choose to say maybe this one can help us in a short run but

to our children this one is what...?

P00 - 1671 it's a danger

E01 - 1672 it's a danger but we don't want to end there, we want to look at to say there where there are some dangers what can we do? Let's not say the government or whatever **P00** will always sit comfortably the problem will be with whom.....?

P00 - 1673 with us

E01 - 1674 Yes... so in short, this knowledge from the time we started to now where we have reached, we have seen the steps that can be taken. You what do you think about this knowledge, what ways can we use so that we try harder to say, now planning... The first lesson was more on the short term but this one is concerned with long term effects. What ways can we use... Or maybe what ways can you implement as individuals or maybe as a **P00** in trying to follow these ways so that we can improve our live. Have you heard me?

P00 - 1675 yes

E01 - 1676 we are looking at... in short, the way forward because us.... we were trying to look at how we can help each other on the ideas looking at the problem that we do what...? And to look at what we do because some feels in the cups while others do not feel in the cups. Now we have seen that if one wants to feel the cups you start saying this year am going to do this. So, what is it that we can put in place together to say maybe this, maybe it is in future, or this year we want to do this so that we try and organize ourselves to start doing what...? So that we start following the steps. If you don't want it's to put it clear because when we started, we did put a rule to say that lets all be free to talk. Let's talk, if it doesn't make sense let's put it clear that this one no. Us we are on the PF side, this

doesn't make sense to say things are just okay.... if they are not okay you say that things are not okay. Let's do something. Am asking on the way forward since we have looked at different pathways of which some pathways empty the cups while others add or feel in the cups.

P09 - 1677 where is the recorder? Yes, my own thinking is that, thank you for lesson one and also this lesson two. It has helped us to screen the problems we have and we have seen. Now my thinking is that the **P00** which started with at first that's the same **P00** you have invited again, that's where I thank you because we are on the same level in thinking band on the lesson. I'm thinking that in this same **P00** if we try to see the way forward or how the development is, though we have different starting points but among ourselves lets know.... knowing that when you go we will be alone so I was thinking that we each identify a project as an individual. We can be monitoring ourselves on whatever we can be doing that which each one of us registered. We can be evaluating our progress to say how is it going or how far have you gone. So, we chose a project each or we can be in a committee like, so that if one of us didn't get the lesson there must be others to come in and help so that no one fails in his or her project. So that we are able to see what each one is doing, if it's keeping goats, we see how it goes. My thinking is that on our own we identify what to do to say this is what am going to do, if its keeping cattle and see how far that person goes, so that at least at the end everyone will have something done that when you come next time we just give reports to say this is what I did, me I did this or this one tried to do this but s/he failed because maybe he bought a cow but it died. So, all of us we

are monitors to see that there is something everyone is doing. That's my suggestion.

E01 - 1678 you have heard his suggestion.

P00 - 1679 yes

E01 - 1680 okay, I was just listening I may have forgotten, what he is suggesting is that within themselves they find ways each individually to various projects or targets of what they are planning to do and they start monitoring and then he gave an example to say that okay if maybe.....

E02 - 1681 individual options

E01 - 1682 yes, individual options and then for example if its banking or saving towards purchasing of livestock or whatever so that maybe within themselves they can be checking to say how far have we gone and in case we are to come back we, we can report to say this one, this is how far and then this one how far and the like so that's.....

E02 - 1683 now have they said something?

E01 - 1684 no, they haven't made any comments. So, have you heard what he said?

P00 - 1685 yes, we have heard

E01 - 1686 okay what about your others because the idea.....

P09 - 1687 okay let's say that the idea or why I thought like that is just to help one another because there is no one who is going to get money and give you but these lessons they are giving us are the ones that are going to help us. So that everyone will have to say we agreed about this and you supervise yourself so that you find something. So that at least from these lessons we should not come up with nothing but we should come up with something which you can manage to do. It can be a simple one, it can be in anyway so that at least you show such that next time we move from step one to step two and accomplish that so that you can plan for the next thing and you continue just like

that until it's a way of life. I don't know.

E01 - 1688 yes, the powers are in your hands not to us. Yes, **P0W** what are saying?

P01 - 1689 say something

P09 - 1690 is it difficult?

P04 - 1691 I think I like the suggestion that uncle has brought out because now we are learning and we should know that what we are learning should not be left here instead be gotten with two hands. Am so happy because the lesson we learnt last time, we have managed to explain it the way it was. So even here now we have learnt how to prepare the future and for me I'm saying yes to uncle's suggestion. I have agreed because I started keeping goats. I want to try to learn on how to manage them because they sleep outside now.

P00 - 1692 laughed

E01 - 1693 okay

P04 - 1694 so, I want to learn on how to manage them so that next time I say this is how far I have gone.

P00 - 1695 talking in the background

P01 - 1696 thank you even me am happy on the part of charcoal even though we complain to say it destroys land and rainfall is disturbed. But it has really helped because when I burnt charcoal I found cash and then bought inputs and did manage to cultivate.

E01 - 1697 now the idea of continuing....

P09 - 1698 now the idea is it that you want to continue.....?

P01 - 1699 I stopped

E01 - 1700 no not that....

P09 - 1701 here we are saying that we are talking about preparing future

P01 - 1702 the way am preparing the future is that, the way I have planted well this year and when I sell the produce I can buy even a small cow if I manage and through God's blessings.

P09 - 1703 no, let's do this you didn't get it. they said we have taught you and now the way we have taught you what are you going to do or what plans do you have because

you have learnt. So, I came up with a suggestion to say...so that the knowledge we have acquired is working, among ourselves when we remain let everyone choose the project which each one wants to do. Each one should find a way of developing. If it's buying a goat, a cow or maybe one wants to save the money to buying something of his or her choice so that in future.... preparing for the future maybe 4 to 5 years from now. We should choose one thing which we can keep or because our source of income... so that's why I said we remain and each one of us chooses a project to do so that when they come, we should just give a report to say from the time you went, from the time you taught me I have bought a cow, me I have bought a goat and I only had 1 goat but now they are 4. That from the lesson I learnt I bought this and if we agree to that idea lets follow it now. When they go we should choose what to do if there is nothing let's remain like this with our problems/suffering because we have received the knowledge. So that's what I'm saying let's agree when they are still here.

P00 - 1704

P09 - 1705

we agree with that
after we know what to do on our own each one should register to say I have chosen this and within a short time we will be done... when you chose that project.

P08 - 1706

P09 - 1707

P08 - 1708

but here there are two things
you should supervise yourself
yes, like the way he has said and like the way we have seen on the example for groundnuts and charcoal. We saw what happened right?

P00 - 1709

P08 - 1710

yes
so, we are agreeing with that idea and now in agreeing to that, let's say when we start something it should give us profit so that even our children should benefit too when we are no more. But now if we start something

which only gives us profit now but at the end is stops... we should bear in mind that we try to teach others as well. Let's also just end by learning but let's also teach others just he said to say if we organize ourselves when we remain.

P09 - 1711

no, you haven't heard the point rather you have missed the point. The point is that we are different families here, each one has a family, so let everyone chose what to do so that he/she can help the family and that project you chose is yours.

P08 - 1712

P09 - 1713

E01 - 1714

each one his or hers?
yes, the project of your own.
but maybe in other ways what he is saying is up to you

P08 - 1715

E01 - 1716

yes
because he is not just looking at his family

P08 - 1717

E01 - 1718

us alone....
so, him he is looking at it to say even others like the way we have learnt meaning we should also start to teach others as well. So, it's like.....yes as families but also his idea is that.....

P09 - 1719

E01 - 1720

but you can't be a teacher before you learn
so that why they are saying that what are we going to do....

P09 - 1721

E01 - 1722

P0M - 1723

E01 - 1724

P08 - 1725

E01 - 1726

okay continue
so am seeing two suggestions
yes
there was an idea of....
planning as a family
each one with the family on one project

P09 - 1727

E01 - 1728

yes
then again there is the idea of teaching the people we stay with.
yes, like for charcoal we have seen the effects at the end, so should we just leave them after us we learnt.

P08 - 1729

P09 - 1730

P08 - 1731

no
so, we need to teach them to say, this which we are doing it's like this and this.

P09 - 1732

E01 - 1733

but that's the beginning of that person
yes

P09 - 1734 that person will stop in future because for now that's his or her beginning. He will stop when he/she reaches at a certain point so that he or she can manage to raise money for that thing which is needed.

P08 - 1735 we didn't say they should stop

P09 - 1736 because we have different problems, I may have cattle but there is something which I may not have. That person, who might not have a cow, let him or her work towards having that cow. If someone doesn't have a goat let him/her work towards having one. We are different so we can't put a uniform to say let's work for one thing no, but each one should do what he or she can manage, which will help him or her family in future

E01 - 1737 *explaining something to E02 but it's not clear*

P09 - 1738 because if it becomes something that should be done collectively we will waste time. We will not help ourselves.

P10 - 1739 have we heard what he was saying? He was trying to say that these are just opening our minds they showed us there on cups. If you get this pathway the cups will do what....? Will be full and after the cups have been filled there must be an improvement to the things that makes the cup full. If there is no improvement, we come to charcoal burning. On charcoal, they have told us that we find cash, sometimes maybe we have problems with rains. So now we look at the future that if we continue cutting down the trees, you do that for many years you can end up getting sick of asthma as others have already said and also the trees will finish hence poor rainfall. So, what should be your plans in working hard? You look at what is causing you to be burning charcoal and remove it because if I buy cattle I can be farming right?

P00 - 1740 yes

P10 - 1741 so now each and every person knows that I do burn charcoal, now I should always be thinking to say what is it that is causing me to be burning charcoal. You identify the causes to say this and this then you ask yourself you say that what do I have to do so that I stop? Or this side we grow groundnuts maybe I grow 5 hectares of groundnuts and I run out of money. If I grew 5 hectares of groundnuts, when I sell I will sell and will have money and if I have money will I go and burn charcoal.

P00 - 1742 no

P10 - 1743 what causes is not producing enough right?

P00 - 1744 yes

P10 - 1745 now they have taught us giving us simple options that are causing the process easy. That we don't go for charcoal burning. When I grow groundnuts, I will grow many and will not make a loss because I had grown a lot. The same groundnuts you exchange with maize. If you produce about 100 bags, you get 30 bags and exchange with maize the 70 bags that remains you sell. How much do you sell in dry season?

P00 - 1746 a bag is k150

P10 - 1747 yes, one bag is about k150, if not it is almost now 150*70 bags..... So that's what they are teaching us, opening our minds on what we should do so that we can enjoy the benefits in future.

P08 - 1748 not just ending here

E01 - 1749 so.... mmmm, us we will wait to hear from you on what way you are going to chose..... aaaah because they are suggesting of self-monitoring

P09 - 1750 yes

E01 - 1751 to say each, one and the like, then there was another idea this side that each one is supposed to be told but us we don't have authority to tell you what to do no. Our authority ends here, like we have been doing, giving each

other ideas to say this way....
check here it is supposed to be
done like this and that.... yes...
so I don't know what you think.
One suggestion... yes.... no, you
can talk.

P09 - 1752 you can give your ideas
E01 - 1753 yes, give it
P09 - 1754 how are we going to use this
knowledge?

E01 - 1755 yes

P12 - 1756 this knowledge is good. We
heard that time when you were
saying you don't give us
handouts to say you this one,
you here, you only give
democracy to someone. When
you are done showing each one
chooses what he or she can
manage to do because choosing
for someone is very difficult in
most cases. If so on these, you
writing to say if things become
had what would you do? You
have just been opening our
minds each one talks just like this
one have said, it depends on
each and every one who feels
that the environment indeed has
changed, the rains are not
enough, the government policy is
there but it doesn't help us to end
our problems, from there, down
there, lives have become
difficult, now that life has become
difficult, what are we going to do?
When we come to the
government, it doesn't give us
enough help, also the
environment we are living in also
has a direction. So, each and
every individual should find what
to do. If they will come, these
people who are teaching us, I
heard he was saying to say what
did you do and what was difficult
for you. I was not there last time
when learnt this but these review
questions were there meaning
that they still want to come again.
Now my wish is that when they
come back to ask us to say now
that there are no rains what are
you doing? If it's a garden let
someone point it out and say
here is the garden I cultivate, the

goats are here, life is not difficult
than it used to be because we
are not just sited to say this life is
difficult, after being difficult, there
are things that can be done so
that it becomes what?

P00 - 1757 become easy

P12 - 1758 becomes easy, because that's
the most important idea so let's
remain and discuss ourselves
and promising them that, when
you come back you will find most
of us, there are ways that we are
doing that are making this
difficult like easy..... if we just let
them go just like that they will not
come back, those who teach
needs children who listens and
understands..... if we just say
there is nothing next time you
should again come back and
teach us and find us at the same
level we were, and things will
become even more difficult, they
will go to Nyimba.

P09 - 1759 yes, we fail, our
children.....

E01 - 1760 so, in short eer, when can you
inform us to say the way forward
is this? Because if we just leave
to say, we left them with a task of
discussing and then they will
inform us to say the plans are
here, no we want..... so that
maybe you say, give us two days
maybe after tomorrow or maybe
after one year or even after 10
years, us we will do what?

P00 - 1761 write

E01 - 1762 to say you said after 10 years
that's when you will inform us
what you want to do, or maybe
after 2 months, because these
same research assistants we
can send them to say, one or two
go there is this issue, they had
told us that when they discuss
that this is what they discussed,
all we want is an improvement of
our....

P12 - 1763 our lives

E01 - 1764 our lives

P09 - 1765 The problem.... Each and every
one who is here knows his or her
problem

P00 - 1766 yes

P09 - 1767 already me I have known my target to say I will touch there, it's not something that I should think about.....as you are sited you know your problem, we don't need to prolong the time on when we are going to inform you. Here each one knows his or her problem, unless you are just refusing, failing on what to do. Again, if it is like that it is a problem that continues in your family.

P00 - 1768 yes

P09 - 1769 now we are saying just here where we are, after having lunch, each one should register on the list of projects to say me I will do that, I will buy a goat, me I will work on this, just like that.

P00 - 1770 yes, that's true

P08 - 1771 on the same paper?

P09 - 1772 yes, on one paper

P08 - 1773 the name

P09 - 1774 yes, your name and the name of the project in front of it.

P08 - 1775 and the project in front

P09 - 1776 if it's buying what..... yaah

P12 - 1777 charcoal.....

P00 - 1778 they busted into laughter

P09 - 1779 I write, so out of charcoal another thing should be done

P08 - 1780 yes, what you will come and see

P09 - 1781 if me it's buying goats, **P09** — livestock. What you register is what you think of doing. So, we register now so that when you come back, we will also be checking ourselves

P12 - 1782 the mirror is going to remain

P09 - 1783 yes, the mirror is going to remain..... when we finish, we will be checking what we are doing, what we wish for is livestock, if it's buying a plough you register it, if it's a goat, maybe a hallow, whatever you are thinking of doing we register to say this I will manage. At least just one should be able to point at to say I have done this because it will make a difference. Whatever we will do, we will make a step ahead.

P08 - 1784 there are the things

P09 - 1785 it is yours

P08 - 1786 in preparation of the future

P09 - 1787 it is for your children and it will remain for them

P00 - 1788 asks a question in the background

E01 - 1789 and also..... that's a very good question..... aaar that, should it just be for the future or short term.... but here, because as we are preparing for the future we start when?

P00 - 1790 now

E01 - 1791 to say long term, what you want in future is this but like we have been looking on steps to say from here it's there, maybe after what I open a saving account this side, the money was at zero now it is so much until you be at another level. The same steps we have been emphasizing, yes when you chose it, if it's a plough that's so, us we will just be looking at you to say ok it is this, this one this s what he wants, desire, your most desire, the direction to say where you are going it's this way, yes.....

P08 - 1792 then we will give you the list when we are done eating, after refreshing our minds.....

E01 - 1793 *talking to E02*

P09 - 1794 yes, this is the knowledge, let's not just forget about it, it will help you and me, it will help you, it is yours, what you will come up it's yours and your children. If we still want to depend on others, **E03** and others if they want to say grandfather is still there....

E01 - 1795 he is still there...

P09 - 1796 he is not there, you chose yours.... it will help us

P08 - 1797 this is the second time, are they going to come again or what?

E01 - 1798 no no the question is that, are you coming back again...?

E02 - 1799 laughs and says does it make a difference?

E01 - 1800 yaar, so for her... aaar... she is saying really, it doesn't really matter whether she comes or not but, we were looking at after this lesson what is it that she will take finally to say after learning this, what you have decided but at the

- same time, even if you say there is nothing which is going to be done, for her she said that is not a disappointment, that's your choice
- P12 - 1801** it's a feedback
E01 - 1802 it's a feedback, so she is saying that it doesn't matter whether she comes or not, the goal....
- P09 - 1803** it's us who are in need
E01 - 1804 yes, it's you
E02 - 1805 exactly if you do something just because I will come back then I won't come back
- E01 - 1806** so, you have heard what she has said that the idea is not that you do something because she will come back no.
- P12 - 1807** she is not Jesus
E01 - 1808 yes, because you have learnt and so after learning it has to improve your lives and your children...yes.
- P09 - 1809** yes, that's good, we understand
P10 - 1810 we will remain with history that, that white woman who came with Dr. **E01** ...
- P09 - 1811** is the one who made me be like this.... That's good.
E01 - 1812 okay, so have we all agreed that we will register?
- P00 - 1813** yes, we have agreed, alright
E01 - 1814 we will register...? What about the nshima?
- P00 - 1815** it is ready
E01 - 1816 okay it is ready... okay that's good
- P09 - 1817** **E03** organize for a paper
 and
P08
- E01 - 1818** but you said it's to prepare
The audience gets concentrated to nshima and the paper; they are just talking almost at the same time
- E05 - 1819** no first let them conclude
P02 - 1820 **E05** remain writing as we bring the food
- P09 - 1821** all the **P0W**, nothing like I'm married, each should do his or her.... let the groundnuts start giving birth to other things.... each one should have his or her own.....it's not good that when you go you say, I didn't do anything
- E01 - 1822** what they are saying is that they will write their names
E02 - 1823 okay
E01 - 1824 they are insisting that today we have to go with the list
E02 - 1825 okay nice
E01 - 1826 so, there was a debate to say that maybe..... (some information not clear but he was explaining on what the **P00** has agreed upon.) What if we do this, as they are still serving food, you can write on this flip chart then we can go with this.... yes
- P08 - 1827** you guys write.... you put our names
P09 - 1828 bring we start
E01 - 1829 us there we are not part of it, that one is yours.
- E04 - 1830** you chose who is going to write
P08 - 1831 you the same one you will write for us....
- E01 - 1832** do you want to write now or after eating?
P08 - 1833 just now
P09 - 1834 whoever comes up with a project, you register even now
- P00 - 1835** others have already decided the projects
E01 - 1836 some of them have already decided on what they will do just now
- E02 - 1837** can they all write at the same time? I don't think we should record this.

Appendix 3. Workshop transcription B

E01 - 1 I was saying that we introduce ourselves quickly. I am **E01**, I work at the University of Zambia in Lusaka; I think most of you know me.

P14 - 2 I am **P14**

E03 - 3 Let it start from this side

P14 - 4 I am **P14**

P15 - 5 I am **P15**

P16 - 6 I am **P16**

P17 - 7 I am **P17**

P18 - 8 I am **P18**

P19 - 9 I am **P19** from Mufwambe

P20 - 10 I am **P20**

P21 - 11 I am **P21** from Mufwambe, Chitumbo Village

P22 - 12 I am **P22**, I stay in Chitumbo Village in Mufwambe. I can say I am a farmer.

E03 - 13 I am **E03**, I stay in Lusaka

E02 - 14 My name is **E02**, I hope you remember me; I came..... I work in Norway at the University, I have been working with **E01** for a couple of years now and I was here last year and **E01** came to Norway and now I am back here, so I think this is great.

E01 - 15 Okay her name is **E02**, she also teaches at the biggest school in Norway. She had come last year and she said that she believes that you still remember her.

P00 - 16 Yes

E01 - 17 Yes, she has come even this year. Now we are just going to give 2 rules, the first rule is that everyone should follow that rule and that rule is that let us be free in our discussions because we are teaching each other, the second rule is just requesting that when you want to talk just like we do, you talk through the..... through this thing so that it can be going around and whoever wants to talk is **P20** this. I do not know if you have heard on this one.

P00 - 18 Yes

E01 - 19 Okay, now in short, I will try to explain the main ideas why we

have come.... the main idea why we have come is that..... we have come for the same message of trying to help each other improve our lives, through sharing of knowledge, we will also learn together and for us what we want most is that our lives should be improving, not just now or next year but also these other coming years, so that even our children should find that we are at a better place than where we started from. So, we know that most people do what..... they come maybe with..... or they give you something but for us the main aim why we come is knowledge, then this knowledge..... like today we will look at where we stopped from last time, and then this year we want to add on a bit, I don't know if you still remember the issue of the cups.

P00 - 20
E01 - 21

Yes

Yes, now there is another lesson which we have brought to say from where we stopped last time..... what if we add a bit again, now the idea with these two lessons is just..... it is just that we will move a bit looking at it to say what options can we use so that we manage to improve our lives now and the years to come in future. Now today we will try to look at what we can do, let us help each other together, what can we do so that the goal we want to see to say the options we can get are these so that when we finish the workshop, each one when going back should know that at least we have seen different options and I think for me, I will use this option or maybe this one so that we improve our lives. Like what I said earlier the most important thing why we have come here is the lesson and looking at the use of these lessons, our lives

		or our desire is that they improve so that even if problems are to come, if we have knowledge it can be easy because it can make us have more options to use, let us do this. So, in short that is the idea we have come with here. Then also, the program is going to be like this; the first thing is that we are going to remind each other or what do you say in <i>lenje</i> ? Okay reminding each other.			the end as it is always, when we finish discussing what we are supposed to do is have a group photo so that we who have attended the workshop can be on the photo together. So, in short that is our program. We will start with what we learnt, from there we are going to look at what it is that we want to do, then we will have a break after which we will continue until we close, we will have what.....a photo. I do not know if I have explained the whole program well.
P00 -	22	It is reminding each other	P00 -	28	Yes, you have explained very well
E01 -	23	Reminding each other just like that?	E01 -	29	Okay.... mmmm.....meaning that we start..... aah.....maybe others have not come, let me ask maybe you have left your wife because this time we want both of you right?
P00 -	24	Yes	P00 -	30	Yes
E01 -	25	Okay we are going to remind each other because some of us may have forgotten what we learnt, some are still remembering, some just remember a bit. So, if we put together what each one remembers, then we will be able to remember the lesson to say it was like this, so that if there are those who did not learn last time, then it can be a chance to learn through the revision so that they also learn, then after that in English they say commercial break.	E01 -	31	The wife and husband will learn together. Is there anyone who has been left out? Mr. P20, have you left her?
P00 -	26	Yes	P20 -	32	Yes, she is committed with something
E01 -	27	Yes, maybe after revision or reminding each other on what we learnt last year, then we will have a short break; if there is food we will eat after that we will look at it to say we have reminded each other and we are on the same level to say we have remembered what we learnt. Then we will start the lessons for today so that we continue from where we left last time. So today I repeat once more – we will look at what we can do now which will help us in the coming years ahead because last time we just looked at..... in short, we did not look at it to say what of the years to come, how are our children going to be because of what we are doing now. So, at	E01 -	33	Okay, are you going to teach her.... you will try... aah yes because if you remember last time you had made a request that even wives should come, yes because sometimes at the barns...
			P21 -	34	She is coming as we go on... she will join us.
			E01 -	35	If she will join us, there is no problem...
			P21 -	36	Okay
			E01 -	37	We can be very happy.....so aah in starting aah.....maybe you do what.....E04 put the flip chart, just one.... yes.
			E02 -	38	This one
			E01 -	39	No, no.....the plain one.
			E02 -	40	Okay
			E01 -	41	Yes
				42	The audience laughing
			E04 -	43	Not the joined one?
			E01 -	44	Not the joined one, yes just that one.....
			E04 -	45	Okay just one flip chart?

E01 - 46	Yes....so now the first question; what did we look at that you remember? What we looked at.....no-one can just begin with this one... yes what did we learn?	P22 - 77	Yes
P16 - 47	What we learnt?	E01 - 78	Yes... explain
E01 - 48	Yes	P22 - 79	We discussed that when you find cash, like us here in the village as farmers, when you produce, we first have cash and then the cash is used to buy inputs.
P16 - 49	We learnt how to manage maize barns	E01 - 80	Okay you have cash and buy inputs using the cash.
E01 - 50	Oooh okay, storing maize	P22 - 81	Yes, from there after harvesting we sell.
P16 - 51	And also, business	E01 - 82	Okay, you harvest and sell... yes
E01 - 52	Okay, keeping/storing maize	P22 - 83	From there ... no before we think of selling, we first look at the issue of food.
P16 - 53	Yes	E01 - 84	Food, food security.
E01 - 54	Maize, then what else did we learn... business?	P22 - 85	Then what remains, the surplus is what we sell
P16 - 55	Business, yes where we find cash	E01 - 86	Okay
E01 - 56	Okay, what else?	P22 - 87	So that we come and look at the issue of inputs
P14 - 57	What we learnt..... we learnt concerning livestock, or just livestock.	E01 - 88	Okay
E01 - 58	Okay, livestock	P22 - 89	Then we look at the issue of implements/tools for cattle if they are enough.
P14 - 59	From there we also learnt about the management of land for cultivation.	E01 - 90	Okay
E01 - 60	Land management, okay.	P22 - 91	Then just there we look at maybe there are some things that are not yet in place on the implements.
P14 - 61	Where we are supposed to cultivate	E01 - 92	Okay, so you looked at livestock, if there is what...
E01 - 62	And fields, right?	P22 - 93	Yes
P17 - 63	We learnt budgeting, how we should budget our farming.	E01 - 94	Then again maybe there are some short comings on the implements
E01 - 64	Okay, budgeting.	P22 - 95	Yes
P17 - 65	And also ploughs	E01 - 96	Yes
E01 - 66	Okay implements, what we are supposed to use like ploughs.	P22 - 97	I am sure others can also talk.
P17 - 67	Yes	E01 - 98	Can you add? Let us talk, what did we discuss?
E01 - 68	Yes	P21 - 99	We learnt how to use the soil.
P15 - 69	We learnt that if we produce, that is when we are supposed to buy bags	E01 - 100	Okay, how to use the land
E01 - 70	To say if we produce, we buy what.....?	P21 - 101	Land
P15 - 71	We buy these we call inputs.	E01 - 102	Yes, you explain.....
E01 - 72	Oooh... so you are saying that what we learnt is that when you produce, you buy inputs.	P21 - 103	From the inputs, we go to the field and cultivate
P15 - 73	Yes, and fertilizer.	E01 - 104	Okay, from the inputs we go to the fields.
E01 - 74	Inputs..... yes, so you are saying from producing then you go to inputs... yes what other things did we learn?	P21 - 105	Yes
P22 - 75	We learnt about how to use money.	E01 - 106	We cultivate
E01 - 76	Yes... we learnt on how to use cash/money.	P21 - 107	From the field when we harvest we find cash

E01 - 108	Okay, after cultivating, all becomes harvest.				preventing them from diseases, we can say dipping.
P21 - 109	Yes	E01 - 147			Dipping
E01 - 110	Then it takes us to cash	P22 - 148			And again, another way, in the kraal there must be a bull.
P21 - 111	Yes	E01 - 149			Okay.....yes
E01 - 112	Okay	E03 - 150			Come and sit on the chair (new member)
P21 - 113	Then also, food is reserved from the same harvest.	P0X - 151			Let us think
E01 - 114	From this same harvest, you have food as well	E01 - 152			Yes, let us think, think..... yes.....so we learnt..... yes
P21 - 115	Yes	P20 - 153			The other thing
E01 - 116	Okay... yes, let us add.	E01 - 154			Yes
P20 - 117	Thank you	P20 - 155			We learnt about management of water, which we use for cooking.
E01 - 118	Okay	E01 - 156			Okay water, in English water.... yes, looking at how we are supposed to do what?
P20 - 119	The other thing we learnt about is livestock like cattle	P20 - 157			Use it
E01 - 120	Yes	E01 - 158			Yes
P20 - 121	To say how can our livestock increase?	P20 - 159			How can we use it?
E01 - 122	Okay looking at our livestock, how they can increase	E01 - 160			Okay
P20 - 123	Yes	P20 - 161			We learnt that.... aah water you fetch from the well.....
E01 - 124	How to increase the livestock	E01 - 162			Yes
P20 - 125	Yes	P20 - 163			You put in buckets
E01 - 126	Okay..... yes	E01 - 164			Okay so from the wells then put in buckets?
P20 - 127	Let me end there	P20 - 165			Yes, in the buckets
E01 - 128	Explain.....you want to end just there?	E01 - 166			Yes, in the buckets.....
P22 - 129	How are they going to increase?	P20 - 167			Yes, and that is the water you are supposed to use on that day so that you do not become careless; just pouring water anyhow.
P20 - 130	The way livestock can increase	E01 - 168			Okay, so that there is no wastage of pouring anyhow?
E01 - 131	Yes	P20 - 169			Yes
P20 - 132 is by managing to keep/source medicine	E01 - 170			Okay, yes what else did we learn? What were we using in our lesson?
E01 - 133	Yes medicine.	P22 - 171			What we were using?
P20 - 134	So that they are not affected by diseases	E01 - 172			Yes
E01 - 135	Drugs	P21 - 173			In our lesson we used land, cash
P20 - 136	And in another way, you can increase them by buying some more.	E01 - 174			Okay
E01 - 137	Oh, buying in English buying.	P21 - 175			Implements
P20 - 138	Yes	E01 - 176			Okay
E01 - 139	So, here you are talking about the ways or options of how to increase livestock.	P21 - 177			Inputs
P20 - 140	To increase the livestock.	E01 - 178			Okay
E01 - 141	Oooh options to increase livestock	P21 - 179			Livestock
P20 - 142	Yes	E01 - 180			Okay
E01 - 143	Okay what else did we learn?	P21 - 181			I think that is where I end
P22 - 144	Just an addition on the issue of options to increase livestock	E01 - 182			Okay, now what of our desire, how was it? Yes, give her. What
E01 - 145	Yes				
P22 - 146	The other way so that the livestock can increase is by				

		did we do when we were learning?			
P17 -	183	Our desire was that all the cups should be full.	P14 -	212	So, we learnt on how to make it full or make it half, what could be the cause and we used water.
E01 -	184	Okay, so our desire was that our cups should be full?	E01 -	213	Okay we were using water?
P00 -	185	Yes	P14 -	214	Yes
E01 -	186	So, in short when we put them again the way you have explained, you said that there was cash?	E01 -	215	Then how were our desires?
			P14 -	216	Our desires were that the cups should be full
P00 -	187	Yes	E01 -	217	Now can you show us what we were doing.
P21 -	188	Land	P14 -	218	Our desires were that this cup should be full of cash
E01 -	189	Land	E01 -	219	Okay, money meaning cash?
P21 -	190	Input	P00 -	220	Yes
E01 -	191	Water Ooh..... Okay then inputs, then?	E01 -	221	Okay hold for me, then what other lesson apart from our desires to make sure the cups are full?
P21 -	192	Livestock			
E01 -	193	Livestock	P14 -	222	The other lesson, we looked at what can make the cups half.
P21 -	194	Implements	E01 -	223	Okay
E01 -	195	Implements, okay	P14 -	224	So, we were explaining one-by-one if for example inputs; we need cash to make sure that there are there.
P18 -	196	Food produced			
E01 -	197	Food produced, okay. Then, what was there? Is this the only way we learnt or...? yes explain, just after that then the lesson ended.	E01 -	225	So, for the inputs to be more here we needed cash?
			P14 -	226	Yes, we needed cash
P00 -	198	No	E01 -	227	Okay
E01 -	199	Okay	P14 -	228	Then from there, for land to produce more food, we needed inputs.
P14 -	200	There were other items like cups.	E01 -	229	Okay, then those inputs come here on land?
E01 -	201	There were other items like cups?	P14 -	230	Yes
P00 -	202	Yes	E01 -	231	Okay
E01 -	203	Okay, now..... do you remember the main objective so that even those who were not here can.....	P14 -	232	Then from there, this water or for the land to produce food we need water.
P00 -	204	Learn.	E01 -	233	So, water is needed even on land?
E01 -	205	Yes, so that even we who were there.....maybe there is something we forgot so that you.....	P00 -	234	Yes
P00 -	206	Remember	E01 -	235	So that.....?
E01 -	207	Yes, you remember, so there were cups?	P00 -	236	It produces more food
P00 -	208	Yes	E01 -	237	Okay, okay
E01 -	209	Now those cups.....can you explain the lesson which was there on the cups.	P00 -	238	laughing
			E01 -	239	Yes, let us contribute
P14 -	210	The lesson which was there on the cups was the issue of cash to say what causes the cup to be full of cash and what causes the cup for cash to be half.		240	Group discussing in the background
			E01 -	241	Here it is.....you remember that she said that you learnt about things which can make the cup full or half?
E01 -	211	Okay	P00 -	242	Yes half

E01 - 243	Now what things did you learn let us say on that one, cash so that the cup is full... what things? Have you heard the question?	P21 - 277	It is carelessness
P00 - 244	Yes	E01 - 278	Okay carelessness
E01 - 245	Okay, this one explained to say the cups.....the ways of filling the cups.	P21 - 279	Yes, that is the first one which can make the cup half
P00 - 246	Yes	E01 - 280	Okay
E01 - 247	Now I asked to say what ways did we learn which can make the cup for cash to be full?	P21 - 281	Not taking good care of the food.
P22 - 248	The ways we can use so that the cups are full?	E01 - 282	Not taking good care of the food?
E01 - 249	Yes	P21 - 283	Yes, not taking good care of the food, the livestock there – also not using the land well can make the cup be half.
P22 - 250	It is through farming.	E01 - 284	Okay, what else can make the cups half?
E01 - 251	Okay, through farming. So, farming is one of the options?	P18 - 285	I do not know, we forgot.
P22 - 252	Yes	P16 - 286	But if they are half, just like now we planted, because for us farmers to fill the cups is by cultivating.
E01 - 253	Yes	E01 - 287	Okay
P22 - 254	Farming; the other way we discussed was doing gardening.	P16 - 288	After planting or cultivating, then when the rains are good
E01 - 255	Gardening?	E01 - 289	Okay
P22 - 256	Yes, then we also discussed business.	P16 - 290	If it is not good and there is a drought meaning everything will be half.
E01 - 257	Okay, business?	E01 - 291	So, if the rains are good meaning the cups will be full?
P22 - 258	Yes business.	P16 - 292	Yes
P22 - 259	The other one is livestock; if we have livestock, we can sell.	E01 - 293	If there is a drought....
E01 - 260	So that.....	P16 - 294	All the cups will be half
P22 - 261	Yes, so that we fill the cup	E01 - 295	Then all the cups will go down?
E01 - 262	Okay	P00 - 296	Yes
P22 - 263	Yes	E01 - 297	Okay, what else?
E01 - 264	Okay, you can add on.	P15 - 298	The other thing we learnt is that we should not just depend on planting maize alone, but if there is a drought we should do some gardening and we use this water.
P00 - 265	discussing in the background	E01 - 299	Okay, so she has added on to say the other thing we learnt was that in case there is a drought, we learnt that we should do some gardening and can add on.....
E01 - 266	Because he mentioned two (2) options.	P21 - 300	To make the cups full
P21 - 267	Very true	E01 - 301	Cash.... yes, so what about available food at home? What makes the food to be full and also to say the cup for food goes down? What did we learn?
E01 - 268	To say there were ways we learnt which can fill the cups and there are ways, which do what...?	P15 - 302	You start....
P00 - 269	Make the cup half.	E01 - 303	Yes
E01 - 270	Make the cup half, now you... you have only mentioned those, which fill the cup.		
P22 - 271	So now, we need those, which make the cup half.		
E01 - 272	Yes, we want all the options we did what...		
P00 - 273	We learnt		
E01 - 274	Yes		
P21 - 275	Things that make the cup half?		
E01 - 276	Yes		

P17 - 304	We learnt that what makes our food reduce is our carelessness	P00 - 324	To be full
E01 - 305	Yes, carelessness	E01 - 325	To be full.....yes maybe there are other things we have left out here?
P17 - 306	and also, us POW if the husband is not around we like buying different things with maize.	P19 - 326	Like on food?
E01 - 307	Okay, buying anyhow	E01 - 327	Yes.... just anything
P17 - 308	Nice food	P19 - 328	Yes because..... bring the recorder, I also throw my idea.....yes because for food to be full like this year, it cannot be full because the rains have been poor.
E01 - 309	Nice things, yes you can add	E01 - 329	Ooh okay because the rains were very poor?
P15 - 310	And also, what fuels carelessness or what leads to hunger is that if our friends (the husbands) after harvesting we sell to make money, they don't give us instead they take the money somewhere else.	P19 - 330	Yes
E01 - 311	Yes.....meaning that we learnt that, men this you make a budget then the money starts going somewhere else then the wives also start saying let me sell some so that I do what.....in the end you are hit by hunger.	E01 - 331	Okay
P20 - 312	Thank you, the other thing that makes hunger hit at home is that maybe, you don't have seed and you just plant recycled seed.	P19 - 332	So mostly for the farmers, it seemed like their crops were being destroyed.
E01 - 313	Oooh the recycled seed.	E01 - 333	They were destroyed..... okay
P20 - 314	Yes	P19 - 334	Yes
E01 - 315	Okay	E01 - 335	Maybe there is any more addition..... okay what if we do this? Mmhhhh I would like to unveil that one now
P20 - 316	So, it makes the maize plants not to have power to grow, because they don't have fertilizer.	E02 - 336	Sure
E01 - 317	Okay	E01 - 337	How do we put this paper, should we put it like this? yes
P20 - 318	They are just planted (the selected seed), and without fertilizer, so this also makes the harvest to be low.	P00 - 338	<i>talking to each other after seeing what is on the chart, the information that they learnt.</i>
E01 - 319	To be low, yes, what else did we learn? I am sure even we who were not there are now getting the lesson.	E01 - 339	Ah.....we want you to try and explain to us
P00 - 320	Yes	P00 - 340	<i>talking to each other as the chart is still being displayed on the ground</i>
E01 - 321	Looking at to say there are other things that we do that makes the cups to be full and the other things that we do that prevent cups from being what?	E01 - 341	Yes, now we want you to explain to us; we explain to each other.....what lessons did we learn? Yes explain.
P00 - 322	Full	P15 - 342	Explaining what is on this chart
E01 - 323	From being full.... yes, but our most sincere wish is for our cups to be full. What.....?	E01 - 343	Yes, each one to explain... each one adds what has been left out, until we explain all of them.
		P00 - 344	These are the things we learnt last time....
		E01 - 345	Now, no bring it here
		P17 - 346	He is saying that bring the recorder here
		E01 - 347	You can start
		P16 - 348	Here we learnt.....
		E01 - 349	Yes

P16 - 350	We have just forgotten some, that's what I have seen.....for this cup to reduce.				meaning that you cannot produce enough, then in the same you can work very well so that you even have money but there are uncertainties like sickness at home, death – all these are “pull-down factors” in terms of money home.
E01 - 351	Which cup?				
P17 - 352	He is saying you explain on what is on this chart.				
P16 - 353	Yes, that is what I want to do..... from there is sickness, if death visits the home.				
E01 - 354	Okay	E01 - 368			Okay
P16 - 355	That is what I have seen	P21 - 369			Sometimes just the climate change; unstable weather conditions also reduce the cup for cash at home.
E01 - 356	Okay, so sicknesses, and funerals				
P00 - 357	Yes, and funerals	E01 - 370			Okay
E01 - 358	Makes the cups reduce	P21 - 371			Then on the cup for food, what can make it reduce even when you had reserved enough are unnecessary debts; debts that useless can affect the food such that you can be forced to be hit by hunger.
P00 - 359	Yes				
E01 - 360	Okay.....yes	E01 - 372			Okay
P21 - 361	The explanation of the lesson	P21 - 373			Then there are animals' diseases (cattle) at a wrong time. It becomes hard that you end-up getting the same food so that you can sell and buy medicine. This reduces the food at home.
E01 - 362	Yes				
P21 - 363	We will start with money, maybe if we have money we buy inputs, after buying inputs, then we will come to the soil and farm because that is our custom here in the village. When we have water, we go to the soil and cultivate, from cultivation we produce then we have food from the harvested food we budget it by dividing it; some goes for selling and other goes for household consumption.	E01 - 374			Are we together on that one?
		P00 - 375			Yes
E01 - 364	Okay	P19 - 376			You have already finished, just finish it completely
P21 - 365	When you sell, you have cash; you can manage to buy some things like livestock that can help you find cash, after selling just like that. Again, you can manage to budget the money, so that even at home they can also buy some things needed; now just here there are “push-out factors” that can make you go down.	E01 - 377			Okay, is there any other addition? Maybe there is something that he has left out?
		P22 - 378			An addition that I want to make....
E01 - 366	Okay	E01 - 379			Yes
P21 - 367	In that it starts from money, because it is the one that is used to buy everything, if you do not have money, you cannot produce a lot of food because you do not have it.....the soil will not produce well. If there are floods again, you can do very well but the crops will be destroyed by the floods	P22 - 380			Is on the land; what makes our cups for land to be bad/half.....some reasons have been mentioned already, is the same method/system of farming.
		E01 - 381			Okay
		P22 - 382			We talked about conservation farming methods, the type of farming that stands the test of time.
		E01 - 383			Yes
		P22 - 384			So, we discussed that for our cups to be full, we need to be planting some trees that add manure to the soil.
		E01 - 385			Okay

P22 - 386 Then the other way so that we improve the soil fertility..... so that the cup can be full is if those trees drop some leaves..... or maybe I end here

E01 - 387 No, you can continue

P22 - 388 We need to be planting trees that add manure so that the cup can be full; the same trees help on the issue of rain

E01 - 389 Rains, okay.

P22 - 390 Yes

E01 - 391 Okay, so the trees also help on rain?

P22 - 392 Yes

E01 - 393 Okay

P22 - 394 Then, these same trees as the Musangu also help in adding lime to the soil.

E01 - 395 Okay, soil fertility

P22 - 396 Yes

E01 - 397 Okay.... then you had something to talk about.... you were pointing at something on the chart.

P00 - 398 *laughing*

E01 - 399 Yes

P14 - 400 Oooh.... here the other lesson that we had was on manure.

E01 - 401 Okay

P14 - 402 That from the same livestock you have you can get and apply on your fields, so that you produce enough food.

E01 - 403 Okay

P14 - 404 Yes

E01 - 405 Yes.....what else, were there no other issues concerning what... concerning piecework?

P00 - 406 It was there

E01 - 407 Yes..... (*Laughs*)... aha..... you explain how we learnt.

P16 - 408 You explain, you are the one with the recorder already at least you have rested enough.

P17 - 409 *laughing*

E01 - 410 Was the piecework filling the cups?

P00 - 411 The piecework.....

E01 - 412 No, you wait..... give her, you give her the recorder, can you explain.

P23 - 413 The piecework.... we discussed that if we do not manage to work ourselves, after

farming/cultivating very well if we fail to manage the crops, the money which is supposed to fill the cup for cash is given to those that come to weed our crops meaning that the cup cannot be full because our working culture is bad, the same money we give those people for piecework so that they can help us fight the weeds in the field, for the crops to grow, that is what I got from what we discussed.

E01 - 414 Anyone with an addition to make? The issue of piecework.....you add.

P17 - 415 On piecework, we learnt that if we run short of money, we go out to those people that offer piecework; we work and help ourselves at home.

E01 - 416 Okay..... have you heard what she has said?

P00 - 417 Yes

E01 - 418 You can go and do piecework and then add on the cup for cash... yes

P14 - 419 The other thing we learnt is that we should not over-do the piecework because if we overdo them, money will always be sweet..... we will always just be weeding other people's fields while our fields suffer in the end hunger shall not spare us.

E01 - 420 Okay, so have you heard that we should not just be going for piecework and forget about our fields.

P00 - 421 Yes

E01 - 422 Okay so meaning that the piecework is on both sides; it adds and reduces the cup for cash?

P00 - 423 Yes

E01 - 424 Okay.... yes, what else?

P22 - 425 The other thing, I can go to crops, the crops that we plant.... we should not just plant one crop but a number of them, so that if our crop does not sell well, the other will and help again on the same crops..... there are crops that build the

body, others protect; this can help us to be planting different crops.

E01 - 426 Crop diversity

P22 - 427 Yes

E01 - 428 Oooh

P22 - 429 Yes

E01 - 430 Okay.....alright. There is somewhere you talked of trees bringing what?

P22 - 431 Manure

E01 - 432 Rain.... oooh.... what makes the rain to be poor?

P22 - 433 What makes the rains to be poor is us people..... all in the purpose of charcoal burning.

E01 - 434 Okay

P22 - 435 You find that the air over blows for it cannot be held back by the trees, if the trees are there it can be blocked, hence the clouds are put together in rain.

E01 - 436 Okay

P22 - 437 hence, increasing the chances of receiving rains.

E01 - 438 Okay

P22 - 439 So, it is deforestation that causes.

E01 - 440 Okay

P22 - 441 Yes

E01 - 442 How does charcoal burning affect these cups?

E02 - 443 *laughing*

P22 - 444 It increases the cup, now.... again, it reduces the cup.

E01 - 445 Both sides?

P22 - 446 Yes.....it gives us money and we lose out on the other side.

E01 - 447 So, in short you are saying that.....okay trees, right?

P00 - 448 Yes

E01 - 449 So, you have said trees here bring rain

P00 - 450 Yes

E01 - 451 Then charcoal....

P22 - 452 Comes from trees

P14 - 453 The trees bring rain and they also bring charcoal, the charcoal brings in cash

E01 - 454 Okay.....the charcoal is between.... trees then charcoal.... then money.... So again, when you cut the tree, no rains.

P00 - 455 No rains

E01 - 456 They are saying that when you cut the trees, the rains reduce.

E02 - 457 Okay..... aah now we want to ask like this to say.... what.... because we.... this side you have talked about tree planting, this side you said good management of food at home.....all what we discussed that can fill the cups; the question is that which things did you try/did you do from the time we were here to say one I tried this and it worked, this did not work out? Have you heard the question?

P00 - 458 Yes, we have heard it

E01 - 459 Okay, because we want to know to say what worked and what did not to what.... did not work, yes.

P15 - 460 Bring it here

P14 - 461 Or you can start

P21 - 462 For me, trying to make the cup full,

E01 - 463 Yes

P21 - 464 I tried to look for some little cash.

E01 - 465 Okay

P21 - 466 I managed to buy fertilizer and seed

E01 - 467 Okay

P21 - 468 I planted maize wanting to fill the cup, but being unfortunate, the maize did not germinate well and also the harvest was bad, so I failed to fill the cup or to reach it where I wanted, so I changed.... I bought a water pump with the little money I got.

E01 - 469 Okay, water pump?

P21 - 470 Yes, I used it for watering the crops so that I can be selling rape, tomatoes and other different crops.

E01 - 471 Okay

P21 - 472 And it started giving me some indication that the cup can be full but again being unfortunate the water level went down but I am trying to fill the cup and I think it can happen from the garden if I am lucky.

E01 - 473 Okay

P21 - 474 Yes

E01 - 475 Now on that water pump; when did you buy it?
P21 - 476 It is about a year now
E01 - 477 About a year?
P21 - 478 Yes
E01 - 479 Okay, alright so you have heard what he tried?
P00 - 480 Yes
E01 - 481 Yes, there was a hand here, then after it we will come that side.
P16 - 482 From the time, we learnt...
E01 - 483 Yes
P16 - 484last year, I also tried
E01 - 485 Okay
P16 - 486 I said in farming the cup is not getting full....
E01 - 487 Okay
P16 - 488 Sometimes it goes up and again it comes down so I said let me try this.
E01 - 489 Okay
P16 - 490 I looked for some little capital.
E01 - 491 Okay
P16 - 492 That small capital...
E01 - 493 Now where did that small capital come from?
P16 - 494 That one?
E01 - 495 Yes
P16 - 496 From the little harvested maize.
E01 - 497 Okay from the little maize.
P16 - 498 Yes
E01 - 499 Okay
P16 - 500 So, I said now, what am I going to do with this small capital?
E01 - 501 Yes
P16 - 502 According to what we learnt that time, I said let me try, I went to Kasumbalesa
E01 - 503 Okay
P16 - 504 I bought goats, took there just like when you take there and if you buy for one million.
E01 - 505 Yes
P16 - 506 You will bring some cash and the cup will go up a bit.
E01 - 507 It increases
P16 - 508 Yes, again you gain some cash from that money and leave some so that I use just like that and that is how we are trying here from the lessons we learnt.
E01 - 509 Okay
P16 - 510 Yes
E01 - 511 So at least it worked?

P16 - 512 Yes, at least it is working because we do not even have a problem of eating at home.
E01 - 513 Okay
P16 - 514 Yes
E01 - 515 Okay, thank you.
P00 - 516 *laughing while discussing something in the background though not clear*
E01 - 517 Yes
P17 - 518 For me, from the time we learnt...
E01 - 519 Yes
P17 - 520 I saw that farming is becoming a difficult thing for me, because I do not have oxen.
E01 - 521 Okay
P17 - 522 I got a loan from AGOLA
E01 - 523 Okay, a loan?
P17 - 524 Yes, that is how I started buying goats and taking to the border to go and sell
E01 - 525 The same Kasumbalesa border?
P17 - 526 Yes
E01 - 527 Okay
P17 - 528 When I started taking goats that side, things became better than the way they were in the past when I came here.
E01 - 529 Okay, yes let us contribute, even you here, there was.....
P14 - 530 That is the same one I had together with that one there.
E01 - 531 No explain because even you.....
P16 - 532 Explain
E01 - 533 You can explain
P14 - 534 For me, from the time we learnt, we also learnt about the early planting.
E01 - 535 Early planting, okay.
P14 - 536 And seed varieties.
E01 - 537 Okay
P14 - 538 Because I saw to say this year the rain seems to be little and now what seed am I going to plant, I planted S13 and if I had planted a late maturing seed, I would not have harvested, but now the maize is okay. And I also planted groundnuts and I said I will not take these groundnuts to Soweto to sell and now maybe I will harvest even 20 bags of groundnuts

and the cup for cash will be full when I sell those groundnuts.

P00 - 539
E01 - 540 *laughed*
 Okay, thank you. Now what other thing did you do as a group because here it was just the family?

P00 - 541
E01 - 542 Yes
 Now from the time we learnt, are there some things you did together as a group?

P00 - 543
P16 - 544 Nothing
E01 - 545 From that time when we learnt?
P16 - 546 Yes
 We have never sat to say from the way we learnt let us make a group and then we make some other plans, nothing.

E01 - 547
P16 - 548 Okay
E01 - 549 Yes
 Now what did not..... difficulties or challenges or what did not work, what are they or what made some of us not to try so that even on that we have lessons to say ooh what made some not to try maybe is this, this and that.

P16 - 550 You had money but why didn't you start a business?

E01 - 551 Yes
P00 - 552 *laughed*
E01 - 553 Or maybe what made things not to work was this and that. Have you heard the question?

P00 - 554 Yes
P00 - 555 *discussing in the background*
P17 - 556 Move back so that these behinds can see

P15 - 557 These are not seeing
E01 - 558 Yes, what made you not to fill the cups? What is it? Maybe there are some difficulties, which you encountered, we do not want just to hear what worked or to say this one worked, this one worked, this one worked. Yes, on that one we have heard, but now we also want to hear on the difficulties to say but for me this did not do what...did not work. Like this he said he bought fertilizer but rains were not good, also he said some money went to buy a

pump again, the rains (the water levels) did what?

P00 - 559
E01 - 560 Went down.
 Went down. What of some of us? What made us to have some difficulties?

P22 - 561 What made us to have some difficulties is water; the rains because of the drought.

E01 - 562 Okay
P22 - 563 That is what caused us not to do well, like for me talking on my behalf, we talked of the issue of planting many different crops.

E01 - 564 Yes
P22 - 565 Crops I had planted.... and after planting many different crops, I found that I will harvest cotton and food also will be available at home even though there was a drought.

E01 - 566 Okay
P22 - 567 I also planted soya beans a little and that shows that on the part of my family, like food and children to go to school – it will not be a problem but unless these other big things not these small ones, the minor problems.

E01 - 568 Yes
P22 - 569 No, they will not be here at my home.

E01 - 570 Okay
P22 - 571 Yes
E01 - 572 What of others?
P20 - 573 I thank you, the first thing....
E01 - 574 Yes
P20 - 575 After learning
E01 - 576 Okay
P20 - 577 I saw to say I got little knowledge but I managed.... when the rains started falling I managed to sit with my family, my wife, and our children; we discussed to say how we are going to plant in the field.

E01 - 578 Okay
P20 - 579 So now I said let us try to change the crops in the field, where we had planted maize, let us put cotton. Maybe it can do well. Where we had planted groundnuts let us plant maize, maybe it can do better. So, I managed to buy some small amount of fertilizer and seed. I

		planted and fortunate enough the maize did better and also the cotton, and I think this year hunger will not attack me and my family.				cups will be full or it does not do what?
E01 -	580	Okay, now P0W have you heard to say, he started sitting together as a family so that they work together and share ideas, now do you remember that others were saying selling maize in small quantities is the only change or maybe it is just the same to say these habits are still the same or who?		P00 -	588 does not get full
				E01 -	589	So, we can either put an end to the problem or do what?
				P00 -	590	Bring it
				E01 -	591	Or fuel it..... that is why we were saying.....really our goal.... the most important idea for us is to say your lives little-by-little should be doing what? Should be improving..... as the years go by you start looking at this cup which needs to be worked on. Since this year we have performed this year, meaning that this year we should do what..... we should improve. So that is the main idea here. Now maybe we can ask to say, is there anything else here that we did not discuss together but it happens? Because it is not that we discussed all the pathways, maybe we had left out some things, have you heard the question?
P20 -	581	Here let us say this year when we harvest, that is when we will see the carelessness if it is still there..... how is my wife keeping/ using food and also that is when they will look at how their husbands make programs because this is the second year from the time we are harvesting crops.				Yes
E01 -	582	Yes... let us add.... because second hand clothes do pass... chitenge materials... kapenta.... cooking oil.... okay maybe there is one with an addition?		P00 -	592	As you have seen this one for charcoal..... we never did what?
				E01 -	593	It was not there.
P22 -	583	This year with this poor rain pattern, we have experienced, there will be a lot of them selling second-hand clothes to say just a gallon.....they will be bringing a lot of good things.		P00 -	594	It was not there, and then now, is there anything else any other? Okay aah... maybe you have any comments? We are almost getting done with the first part.
				E01 -	595	I would not qualify to pass a comment..... I think so
P17 -	584	But I think there is some chance because getting money or credit and paying back with interest (soft loans among themselves) ... they stopped doing it.		E02 -	596	Maybe I ask; what caused you not to gather yourselves so that you help each other, so that you can be improving or making small groups.
E01 -	585	Yes, give her the recorder		E01 -	597	That idea did not click at all
P17 -	586	I am saying there is some change because before the lesson, most of the people used to get soft loans from fellow farmers, this in most cases does not help, it pulls down, at least nowadays most of them stopped.		P17 -	598	Where is the recorder? You give her.
				E01 -	599	What made us not to gather ourselves to make the program is that we never chose a leader to say maybe now that the chairman has said we should do this and that, we were just on our own.
E01 -	587	Okay thank you.... aah....we have seen that in one way or the other our actions are the ones that determine whether our		P14 -	600	

E01 - 601 Okay what else? Okay.....
P16 - 602 We were not told that day that we should make a committee
P17 - 603 And also, you never told us that we should do that.
E01 - 604 Okay, yes now this issue is crucial; that one is very important because our idea once more is to look at the problems that you yourselves and your children in future will find so that at least they say our father left us on a good note such that where we are starting from is better than if they had not done this, so in short the most important idea/goal for us is that we cannot tell you to say go and do this and that, no. we are just sharing ideas just like we are looking at to say this side the charcoal gives you money, this side or maybe in future what will our children do because maybe trees will do what?
P00 - 605 Will finish
E01 - 606 Yes, but we will not give you to say do this or do that, no. we are just sharing ideas to say let us consider our actions and let us choose the ones that will help us fill our what?
P00 - 607 The cups
E01 - 608 So...aah maybe as we continue.... aah as we are continuing aah.... again, I can repeat to say.... the lessons.... lessons are just the same; this lesson and the one we are supposed to learn to day and what.... they are the same and the goal is the same about improving our lives.... mmhhh.... then because the most important.... aah that we give is this same idea and knowledge. It is not that when we come.... yes, maybe others give relief food, what and what.... For us we have said no.... we just give what.... we give knowledge and then that knowledge to you and then also we are learning, now we are both learning..... yes.... so, our

greatest wish is that if you see that you have been faced with a problem.... where you can I touch and after I have known where to lean on, will these others be okay, so that we can help each other to say no let us be more considerate of what we do so that our crops cannot go where? Cannot reduce.... eeeh the.....maybe we go to the second part.....I was explaining this and then that.... so maybe we go to the second part.... you give me.... aah.... just this one (wanted another flip chart). I have a question.... eeeh you used a very good word in tense, it is what land....

P00 - 609

E01 - 610

P19 - 611

P22 - 612

E01 - 613

Yes
land does not just mean land, right? What is land?
It is just land
It involves trees, land...
Yes, so we are going to use that same one, land.... now I want.... if I am too fast, you tell me to say there you are too fast so that I go back because now we want to at this lesson.... the whole lesson that we have discussed..... we want to go to another step... the aspects/areas we see the areas, the first aspect we said land/environment or management in other words, in English we can say environment but we just say land, the second part we are going to look at.....is to look at..... in English they say maybe there are policies but we are looking at the government.....now here it is not that there are politics, no! government in the context of....like here on the issue of government, one thing that we have not talked about that side, last time we talked about FISP, do you remember?

P00 - 614

E01 - 615

Yes
Yes, meaning that the government also has a part to play in our everyday lives.

P00 - 616 Yes
E01 - 617 And the environment also has a part in our what?
P00 - 618 In our lives.
E01 - 619 Because in that land everything like trees, charcoal, rain..... all these are found where?
P00 - 620 on the land
E01 - 621 Meaning that all aspects of our lives are concerned about the what?
P00 - 622 The environment
E01 - 623 Yes environment, then the third one also concerns life.... the way we live or socio-economic because in life these two..... there is another part to say the way we live, there are businesses, ways of finding money to say sometimes you are faced with a problem like sickness, maybe a funeral; all these concerns in our lives meaning that all these three.... now on the environment, we just want us to look at rains.... we want to look at rains then apart from that, here we will just look at this program called what?
P00 - 624 FISP
E01 - 625 Now we are going to look at..... not just looking at this year..... our idea is to look what change we have noticed on the issue of rains. Is the rain improving to say when you look you say now children here are going to be okay.... it is becoming okay, or maybe the rain..... the rain pattern is becoming poor and poorer such that maybe it will be worse for our children in future. Then again in this program you will look at this side where we are coming from, how it is, what about where we are going, can you also say in future you will just be smiling because of this program to say this program will be okay in future or maybe you have some sense of worry to say maybe it will become bad..... are we together on that? So here meaning that the

scenarios we will just say the situation..... the situation in future not tomorrow but in future that if you have grandchildren, the situation of rains..... when you just think of the rate at which you are moving, now will it be.....will you smile to say things will be okay or maybe you will have a situation..... because there are only two things, or maybe three; it is either you are smiling to say it is fine, maybe you are saying in future things will be worse or maybe even though things seem bad, but I think it is okay..... yes, have we heard?

P00 - 626 Yes
E01 - 627 Now, how do you look at the rains? How can you evaluate it here, what can you put to represent how it will be in future in accordance to the way it is nowadays? And you are going to use the symbols for smiling or maybe you are sad or maybe you will put the one that represents average to say no it is fine.
P19 - 628 You answer **P17**, you are the one with the recorder.... it is to answer then she will write this side.
E01 - 629 Who can write for us here on rain? What do you think?
P17 - 630 I think it is okay.
E01 - 631 Yes, you think that in future things will be fine..... yes
P14 - 632 This rain in future there will be nothing at all.....last year it left the crops before complete maturity, then again, this year most of the maize were destroyed so in future there will completely be nothing; we are in danger.
E01 - 633 We are in danger?
P14 - 634 Yes
E01 - 635 Mum you can write "we are in danger," which one are you going to put?
P17 - 636 Where are you going? We are learning
P16 - 637 I want to buy some tomatoes

P17 - 638 You want to buy tomatoes when you are learning?
E01 - 639 Then where.....
P19 - 640 The first one is the one that represents danger.
P14 - 641 It is the one for danger.... okay.... we even put eyes.... it is supposed to be big.
E01 - 642 Even just like that, so you are saying in future on the rains we are in danger?
P00 - 643 Yes
E01 - 644 Okay, thank you, what about you men on this one; on FISP, the cooperative..... nowadays you have vouchers?
P22 - 645 Even there we are in danger; there is nothing good in the future, nothing good.
E01 - 646 Okay, you can draw which one?
P14 - 647 Where?
E01 - 648 Just there on FISP, yes just there. Or just draw that thing.
P14 - 649 We are in a fight
P00 - 650 *laughed*
E01 - 651 Okay we are in a fight on this one. So, what of the livelihood; life..... is it becoming easy to say at least now we are better or is it becoming hard to say nothing will happen? What do you think on that one, the livelihoods in future?
P19 - 652 Just let her write.
P00 - 653 *laughed*
P14 - 654 Maybe it is better for you?
P24 - 655 Just from what I see, life will be hard.
E01 - 656 Okay, it will be increasingly hard?
P00 - 657 Yes
E01 - 658 Okay, maybe let me ask now, what is causing here on the rains..... but let us not forget that the lesson is just the same from there to say these things are connected to each other, now here why do you say that in the near future the rains will be a problem and you are in danger, why?
P14 - 659 Bring it here
E01 - 660 What is causing
P16 - 661 You bring it (recorder) here
E01 - 662 Ooh okay

P00 - 663 *laughed*
P14 - 664 *passed a joke*
P00 - 665 *laughed*
P14 - 666 there are no rains because there are more charcoal burners.
E01 - 667 Because of charcoal?
P14 - 668 Yes, we have cut down most of the trees
E01 - 669 What else, what else?
P22 - 670 The other one I can say like mines when they are doing the mining, they pollute the air.
E01 - 671 Oooh, okay alright. Now what of here, why do you say on this FISP there will be a fight to say we are in danger, why?
POW - 672 *talking in the background*
E01 - 673 No, wait give her (the recorder)
P00 - 674 *laughed*
E01 - 675 Yes
P15 - 676 Why we say we are in danger just like this year, some vouchers did not come out.
E01 - 677 Okay so even now?
P00 - 678 Yes
P22 - 679 Still waiting
E01 - 680 Still waiting?
P00 - 681 Yes
E02 - 682 Okay
E01 - 683 Yes, you also explain
P24 - 684 I said we would have some difficulties in future because the way things are being done, the way they are saying them
E01 - 685 Okay
P24 - 686 If they say let us change and I do this, then those things will not even work out and that's the challenge we are facing.
E01 - 687 Okay, so meaning....
E02 - 688 Thank you
P00 - 689 *laughing*
E02 - 690 Twalumba (meaning thank you in English)
P00 - 691 *continued laughing and passing comments*
E01 - 692 So, you are saying the way they are doing things, they do not move.....
P24 - 693 The way they talk about them
E01 - 694 Okay, aah okay
P22 - 695 It is different from what they are doing
P14 - 696 Another one?
E01 - 697 Yes

P14 - 698	Bring it (recorder). The other thing I will say is changing of leaders because when there was Kaunda, things were different; Chiluba came, things were different and now today we have these vouchers and in future it will just end like that.	P20 - 725	Then people will opt to cut down trees so that they find food and it will also be found that the trees have done what?
E01 - 699	Ooh so....	P00 - 726	Finished
P14 - 700	Changing of leaders or presidents	P20 - 727	Has finished so life, for us to find food so that we survive will be very difficult.
E01 - 701	Okay	E01 - 728	Okay, now let us do this – give me the cups because you are saying.....or let us say this cup should be for what.... for government because you just explained.....now what of this cup if it becomes for land, no rains, then you said that land. Now let us use the cups so that we see what is happening
P14 - 702	Yes		
E01 - 703	Change of leadership	P00 - 729	Yes
P14 - 704	Yes	E01 - 730	Give us the water. How is our desire on the part of rains? No even just here, so how do you want it to be?
E01 - 705	So, you are saying the time for Kaunda it was there?		
P14 - 706	Yes	P20 - 731	Our desire on the part of rains?
E01 - 707	Then they are reducing?	E01 - 732	Yes
P14 - 708	Yes	P20 - 733	It is that when rains fall well, we find food.... we cultivate our fields
E01 - 709	Until now when you are just given....	E01 - 734	Then you want the cup to be.....
P00 - 710	Vouchers! Yes	P14 - 735	So that it is full or half or it is....
E01 - 711	Ooh okay, now why are we saying that life will be hard? Here to say life will be what...?	P20 - 736	It should be full
P0W - 712	It will be hard	P14 - 737	It should be full so that it becomes floods?
P24 - 713	We have seen to say life will be hard in future because rains are not good, and when there will be no rains in future meaning life will be hard for us farmers also, the government was helping us on the part of fertilizer and now if we are to say an individual alone cannot manage if rains are not good and if the government is not helping.	P00 - 738	laugh
		E01 - 739	Okay wanting the rains to be more.
E01 - 714	Okay	P00 - 740	arguing in the background
P24 - 715	So, you find that life will be hard	E01 - 741	The desire for rains
E01 - 716	Okay	P00 - 742	Yes
P19 - 717	That is the point I had too	E01 - 743	What of land? How do you want the land to be? Your desire....
E01 - 718	Okay, maybe there are some additions which are there?		
P20 - 719	The other addition is that challenges are there on the part of the rains, it is not raining well	P20 - 744	When we come to land....
		E01 - 745	Yes
E01 - 720	Okay	P20 - 746	There will be a problem, trees will finish, and also the government will come in to protect the trees
P20 - 721	So, when we look in the future, water will be difficult to find.	E01 - 747	Yes, now before you go there, what of the desire.
E01 - 722	Water will be difficult, low water, okay continue	P20 - 748	The desire is that....
P20 - 723	Doing gardens..... water will be difficult for us to find food.	E01 - 749	Okay let us say this is land....
		P20 - 750	The cup should be full
E01 - 724	Okay	E01 - 751	The land should be there?
		P20 - 752	Yes, it should be there

E01 - 753	Okay	E01 - 784	On the environment
P14 - 754	Cup level	P20 - 785	On the environment, because there is no rain we will start cutting down trees so that we can make charcoal
E01 - 755	Okay, this environment; trees, land, everything should be okay, then on this one we are looking at fertilizer from where?		
P00 - 756	From government	E01 - 786	Oho
E01 - 757	From FISP... how is your desire?	P20 - 787	We find money through charcoal so then we can buy food
P20 - 758	Our desire is that the government should be helping us with fertilizer so that hunger can be reduced..... so let the cup be filled to brim.	E01 - 788	Okay, so in short you are saying because the rains are poor on land you start cutting down trees for charcoal that side?
P14 - 759	8 * 50 kg bags of fertilizer	P14 - 789	You cut down trees on the environment
E01 - 760	Oho 8 * 50 kg packs?	E01 - 790	You cut down the trees, because the rain is poor?
P14 - 761	Plus, land and plus more water.		
E01 - 762	Okay	P00 - 791	Yes
P14 - 763	Is equal to harvesting	E01 - 792	Okay, you cut down (meaning reduce the water in the cup)
E01 - 764	So, what does fertilizer plus land plus water give us?	P14 - 793	Now I will just be cutting near, the axe has a problem (jokingly as she reduces the water in the cup)
P00 - 765	Good/comfortable life		
E01 - 766	Good life	E01 - 794	When you cut down the environment such that it remains almost bare what happens to these other cups or maybe we come to what?
P00 - 767	Yes		
E01 - 768	Good living, now this is just your desire, now what really happens? Here we have said in future, we should start, where should we start? In future that is what you were explaining.... what happens, this is rain, land then it is government, what happen here?	P00 - 795	To FISP
		E01 - 796	Yes, on FISP, yes
P20 - 769	We come to rain	P14 - 797	The government will now come in to say....
E01 - 770	Yes	E01 - 798	Yes
P20 - 771	What is happening nowadays is that the rains are reducing	P20 - 799	Oh, people have become careless in the country, they will start prohibiting cutting down of trees because there is no rain.
E01 - 772	It has reduced		
P14 - 773	Percentage	E01 - 800	Oho okay.... yes, because of what? So, you are saying because there is no rain, people will start cutting down trees?
P20 - 774	So.... now the cup will not be filled, because we would have been hit by hunger in the country.		
E01 - 775	Okay	P20 - 801	Yes, because there is no rain
P20 - 776	Because there is poor rainfall	E01 - 802	The government will restrict the cutting down of trees then now, if they have stopped you from cutting down trees, what will happen this side now? What is it? At what living.... yes, you explain, give him the recorder....
E01 - 777	Alright		
P20 - 778	Farming will be poor maybe food will not be coming from the field.	P22 - 803	When the government restricts the cutting down of trees, meaning that life will become
P19 - 779	25..... 25%		
E01 - 780	Should she reduce even more water?		
P20 - 781	Yes, let us go down even more		
E01 - 782	Okay, now what happens to the environment?		
P20 - 783	What is happening on land?		

difficult because there will be nothing to do.

E01 - 804 Okay so what about this cup for government, FISP? What is happening? Is the cup still full? At what stage are we, will it remain full just like that or what? What.... of government FISP packs?

P19 - 805 But here FISP is helping in terms of fertilizer but there is something that the government helps with

E01 - 806 Yes

P19 - 807 If it sees that these people are experiencing droughts, maybe floods, dry spells, it manages to help people by bringing maybe some 50kg bags of mealie-meal every month so it will be helping but only a little not fully.

E01 - 808 Okay, what if it is not full? Because what I am seeing here is that it is full.

P19 - 809 Yes, that is it, if it can be at this level in....

E01 - 810 In future

P19 - 811 Yes

E03 - 812 So here will they continue giving you the same way they are giving you now?

P14 - 813 So here fertilizer in future....

P19 - 814 Fertilizer will be there but not like it is now

P14 - 815 Should we reduce the cup to half?

P19 - 816 Yes, you can just leave it half way

P22 - 817 They want the cup to be filled to the brim.

E01 - 818 Aah alright because I was looking at land here, you cut trees.... what makes you cut trees is because of poor rainfall. Now, when the trees are cut, how is the rain pattern?

P20 - 819 It will completely go down...

P0X - 820 Then it completely goes down

E01 - 821 Okay, alright.... maybe there is someone who wants to add on, have we seen here to say you cut trees then the rains reduce, again cutting down of trees have made the rains to do what?

P00 - 822 To finish

E01 - 823 To finish instead of it increasing the cup, it is now reducing it.

P00 - 824 Yes

E01 - 825 Okay alright, maybe there is someone with an addition? What if we look at what we can do.... I hope, I am sure you have seen that the lesson here does not only look at the present or short term plans but it is about preparing for the years to come in future because you can say this time the rain is like this, we should not just prepare to say, okay this year, no we should start looking at what it is that we can do now so that in future if it reduces even more, it should find that we are already prepared..... this is where the lesson is, previously we were looking at preparation in short term but now we are looking at future plans..... yes, so what is it that we should do?

P22 - 826 here what we are supposed to do so that in future we benefit is planting trees.

E01 - 827 Planting trees.... how do you call tree planting in English?

P21 - 828 Afforestation

E01 - 829 Afforestation.... what else?

P14 - 830 You are right, tree planting in Lenje; we who are dull cannot read the word Afforestation

E01 - 831 Oho tree planting (writing it in Lenje)

P14 - 832 So that we can be remembering fast.... because you can just remain starrng at the word "Afforestation" without understanding what it is... (*laughing*)

E01 - 833 Yes.... why do we need to plant trees now...? or maybe you wanted to plant after it has finished raining?

P20 - 834 Starting now

P15 - 835 You start planting now

E01 - 836 Okay, we start now, okay.

P21 - 837 Trees are supposed to be planted now because we have seen that the rains have become unstable, now when we plant trees, they will help hold

the air then it will start improving.

E01 - 838 So, what will happen now if you start planting trees this side on the land?

P21 - 839 The cup will become full

E01 - 840 Then again.... you can demonstrate

P14 - 841 This is land

E01 - 842 Yes

P21 - 843 Yes, it will go up a bit.

P14 - 844 It should just go up a bit but now full

P21 - 845 Yes, we should be going bit-by-bit

P14 - 846 It will be at this level I think it is better.

E01 - 847 So, if land increases meaning..... what of the rains, what happens?

P21 - 848 Even rains will increase; it will be okay.

E01 - 849 Rain will also increase

P00 - 850 Yes

P14 - 851 Rains.... like this it is fine?

P00 - 852 Yes

E01 - 853 Okay

P14 - 854 At least 719 seed can mature

P00 - 855 *laughed*

P22 - 856 After planting the trees, we need the rule now

E01 - 857 Okay

P22 - 858 For cutting of trees so that we do what?

P00 - 859 We do not cut the trees

E01 - 860 Okay, there should be rules

P22 - 861 Yes

P21 - 862 The government will now come in.

P14 - 863 The government now comes there

E01 - 864 So, the government should put a rule

P00 - 865 Yes

E01 - 866 Okay, what else are we supposed to do when the rains are few? You said planting trees.... apart from planting trees you said putting a rule

P21 - 867 The other thing we are supposed to do?

E01 - 868 Yes

P21 - 869 On the part of FISP, we should not just wait to say the government should give us.

E01 - 870 Okay.

P21 - 871 Let us try to also use manure

E01 - 872 Okay, on FISP here, we should use manure

P21 - 873 Yes

E01 - 874 Yes

P21 - 875 When we use manure, that thing of waiting to be given fertilizer will reduce and our crops will grow well, so if rains are okay then what will remain is to look for manure and when we use manure our crops will grow well so that our cups can increase.

E01 - 876 Okay, now apart from using manure.... because do you remember there on the first lesson, the cups we had for cash need to be doing what?

P00 - 877 To be full

E01 - 878 The cup for food at home should do what?

P00 - 879 Be full

E01 - 880 Yes, now we are in a situation where rain does what?

P00 - 881 It is a problem

E01 - 882 Now the cups for cash.... what are we going to do? How about the cup for food at home? What are we going to do so that we.....even if there is no enough rain, food at home should do what?

P00 - 883 Should be there

E01 - 884 Should be there so let us not just consider rains alone but we are looking at time to say it is changing and rain is not doing what.... it is not there but our desire is that our crops should be what?

P00 - 885 should be full

E01 - 886 Yes, even if our grandchildren by that time.....their cups should be full because you did something for them, so now what are we supposed to do? So, we are not just looking at the cups for land only.

P21 - 887 It is to buy livestock

E01 - 888 Buying livestock

P21 - 889 So that they start producing

E01 - 890 Livestock, what else?

P21 - 891 Also learning how to keep chickens

E01 - 892 Knowledge

P21 - 893	Yes		FISP? Manure is one, what else?
E01 - 894	Have you heard what he said?	P16 - 916	Lime
P00 - 895	Yes	E01 - 917	Lime. The second one.....
E01 - 896	Okay, learning. Now learning how to keep chickens but you already keep chickens.		What else?
P00 - 897	Yes	P15 - 918	Chicken manure
P21 - 898	Yes, but we just live with them, we do not rear them.	E01 - 919	Chicken manure, okay composite manure?
P00 - 899	<i>laugh</i>	P15 - 920	Yes
E01 - 900	Okay, you just live with them, yes...yes	E01 - 921	Okay composite, have we heard the question?
P16 - 901	We want them for business that's what we are learning	P00 - 922	Yes
P21 - 902	We just live with them but don't rear them.	E01 - 923	We want to make sure that the cup for cash is full. Cup for inputs should also be full. Even if things are hard because the government stopped giving but at least one should be managing. So, what else can you do? You mentioned two things which are lime and manure, yes
E01 - 903	Yes, or give him we hear		
P21 - 904	<i>laughed</i>	P24 - 924	The other thing which we can do, I can say changing of crops so that the soil is revamped.
E01 - 905	They are saying that there is a difference between living with chickens and rearing them	E01 - 925	Okay, changing of crops; crop rotation. Yes, what else? The government stopped giving fertilizer and then at home we need to make sure that there is no hunger, what is needed to be done? Is it just manure, lime, and crop rotation?
E02 - 906	Okay		
E01 - 907	So, they are saying that no..... yes	P24 - 926	The other....
P16 - 908	Yes, we just live with the chickens	E01 - 927	Yes, continue
E01 - 909	Okay	P24 - 928	I can say if you have some livestock
P16 - 910	But the chickens for rearing he mentioned and when you have them, you will know to say I am on this stage and I will know to say I should keep chickens for business, if I want to sell, I just get a vehicle and take to Chibombo to sell..... and I will know that I have gained knowledge.	E01 - 929	Yes
E01 - 911	Let us also know that when you do that, it should help you in future so that even if.....	P24 - 930	You can sell so that you buy fertilizer
P21 - 912	There will be no rains	E01 - 931	Okay, selling livestock, yes
E01 - 913	Okay, so you said you have put business, okay, what of here on FISP; fertilizer is difficult to access and you said there is a danger on this one..... even if there is a danger, our objective is that in future, 5,10 or 15 years from now if they say no more FISP, what we want is that our cups should....	P22 - 932	Planting so many different crops
P00 - 914	Be full	E01 - 933	Okay, planting many different crops
E01 - 915	So now what can we do so that the cup will be full even if the government does not give us	P22 - 934	Yes
		E01 - 935	Okay, maybe there are other things which we have left out....so in short let me repeat the question – you said that when you plant many different crops and you have livestock which you can sell, also you do crop rotation, apply lime and manure, and then hunger can end through these, yes.

P20 - 936 The other thing which can help us not to have hunger in our homes....

E01 - 937 Yes

P20 - 938 We can make blocks,

E01 - 939 Okay

P20 - 940 You burn them so that people can buy and money will come in your pocket.

E01 - 941 Okay, aaaah, okay alright what of..... yes

P22 - 942 If we build a house

E01 - 943 Yes

P22 - 944 It can help if we build like our friends do

E01 - 945 Okay

P22 - 946 So that in future.... we are preparing for the future, right?

E01 - 947 Yes, the future

P22 - 948 Building houses

E01 - 949 Okay, building houses

P22 - 950 Yes, and we put them on rent

E01 - 951 Ooh okay, okay yes, yes so that you become land lords

P22 - 952 Yes

E01 - 953 Okay, now what of here when you look at the livelihood to say life in future, what does it do?

P00 - 954 It becomes hard

E01 - 955 It becomes hard, where can you pass, which options are you going to use when livelihood is hard? So, preparation which you need to do now or what options can help us so that even if life becomes hard, you will be saying but at least because of this and that option, yes give him (the recorder) that side.

P24 - 956 I think just to add on....

E01 - 957 Yes

P24 - 958 If we take care of what we have said..... if it means planting trees, we plant

E01 - 959 Okay

P24 - 960 Then we also put manure in the field, also building houses in town so that we can be getting some rentals.

E01 - 961 Okay

P24 - 962 Then it can help to make our lives a bit easier

E01 - 963 A bit?

P24 - 964 Yes, it can improve for our children

E01 - 965 Okay, so in short, he is saying all these can come here, maybe there is someone who wants to add on?

P19 - 966 The only addition is that.... but it is still there, if we keep many livestock maybe reach even a bigger number, even if life becomes hard, you can still manage to survive by other means, if there is a problem, you get one livestock and sell

E01 - 967 Okay, now what of here if water is a problem, if we go back to this, water does what..... becomes a problem then what options can you use? Yes, water is needed..... because here you just said planting trees, selling livestock but also livestock will need water, right?

P00 - 968 Yes

E01 - 969 Then and doing business

P22 - 970 Here we can say the other way is drilling boreholes

E01 - 971 Okay to drill boreholes

P22 - 972 Yes

E01 - 973 Okay, yes, I said if I am fast you do what? You slow me down, so I repeat, that side we saw the lesson for cups, right?

P00 - 974 Yes

E01 - 975 And how we can do what? We can fill them, now here it is the same lesson. It is just that here we are looking at it to say how can we make the cups full in times of hardships in future and we looked to say land is changing, the way it rains, the trees also..... land is changing, now how do we prepare so that in future the cups should also be increasing even if things are what... are hard. So, it is preparing for the future. Mostly how do you prepare? Do you prepare for the future or you just prepare for the present?

P00 - 976 For the future

E01 - 977 You prepare for the future?

P00 - 978 Yes, so that things are better in future

E01 - 979 Okay, because what we mostly want is not just to prepare for 2

or 3 years, no but you should look at it to say the future.

P22 - 980 Let us see

E01 - 981 Yes, go ahead

P22 - 982 I think here also conservation agriculture can work

E01 - 983 Okay

P22 - 984 We can put it

E01 - 985 Where

P22 - 986 Here

E01 - 987 Here?

P22 - 988 Yes

E01 - 989 Okay, okay maybe there is someone with a contribution? Now if it is preparing, when are we supposed to start, yes **P0W**

P0W - 990 Preparations must just be continuous

E01 - 991 It should be continuous?

P0W - 992 Yes

E01 - 993 Okay

P22 - 994 I can say preparations for us who are learning can start now

E01 - 995 Okay, alright

E01 - 996 *explaining to **E02** in the background and also group members discussing in the background*

E01 - 997 So, when we started I said we are going to learn then afterwards we will have a what?

P00 - 998 a break

E01 - 999 Yes, even those who read news go on commercial breaks right?

P00 - 1000 Yes

E01 - 1001 Yes, even when you are ploughing, you go where the field ends and rest or have a commercial break.

1002 *After the break*

E01 - 1003 So, I think now we will start from where we had stopped from, we will start or we were saying what to do.....now we will start from planting trees, then on the planting of trees, what measure are we supposed to follow or what are we supposed to do which can put us on the level where we plant trees say maybe on the field. Have you heard the question?

P19 - 1004 Maybe you can come again

E01 - 1005 As you saw, we said when preparing if rains change we

should do what.... we plant trees which is afforestation. Now when planting trees, there is an order to say we need this and that until you reach a point to say we can plant trees, because the idea is that we want to see the steps which we are supposed to do so that you can see that here there is a tree which we have planted, do we agree that there are steps which we need to take before planting the trees otherwise we would have just said let us go and plant the tree and then get.....so meaning there are some things which we need to do what.....

P00 - 1006 To do

E01 - 1007 Yes, so the steps.....after doing this, next thing is this then all the steps until we say okay I have planted the tree, because these steps are the ones which will remain if we want to do this, these are the steps to use or step 1, 2, 3, until you plant the trees or what is needed for us so that we can manage to plant the trees. Have you heard the question?

P00 - 1008 Yes

E01 - 1009 Okay because, because our desire is that land does what.... is okay. The cup for land should be what.... should be full because that is our goal, then now we will look at from that goal, what we want to do is that we need to do these steps; this, this and that so that when we reach there our land should be..... okay, so what are we supposed to do now so that we manage to do what..... we manage to plant trees so that our goal..... the cup for land should be increasing and going on top. Yes, let us start talking or number one

P19 - 1010 We need seed

E01 - 1011 We need seed?

P19 - 1012 Yes

E01 - 1013 So....

P22 - 1014 After having seed, we prepare the nursery and plant.

E01 - 1015 Nursery, then?

P22 - 1016 After the nursery, we plant and when they grow we trans-plant

E01 - 1017 Okay, so where do you find these nurseries or seed because here we want to know the route to say from here we should go to this step and you said seed from where? We want concrete steps, what you said is okay, now let us add from what he has said, where are we going to find the seed, yes POW.

POW - 1018 **discussing in the background**

P16 - 1019 Here let it start first then that is when I am going to come in

P14 - 1020 Where we find them

E01 - 1021 Yes, trees

P14 - 1022 About trees we can see the Conservation Farming Unit (CFU)

E01 - 1023 Okay you see CFU

P14 - 1024 **talking in the background**

E01 - 1025 No speak up and talk through the recorder there

P22 - 1026 Also, from the climate change

E01 - 1027 Okay, organization for climate change?

P22 - 1028 Yes

E01 - 1029 Okay, yes so let us say I start off and go to CFU or Climate Change Organization, then?

P21 - 1030 Even DAPP

E01 - 1031 Okay even DAPP. So, what am I going to get or to do?

P21 - 1032 at DAPP we also find plants

E01 - 1033 Okay, DAPP?

P21 - 1034 at DAPP they have plants and seeds at CFU

E01 - 1035 okay, these...

P21 - 1036 Yes

E01 - 1037 Seeds okay

P21 - 1038 Even those other organizations are found with seeds and plants

E01 - 1039 Okay

P21 - 1040 Yes, so we go and buy from these people

E01 - 1041 It is to go and buy?

P21 - 1042 Yes

P22 - 1043 Like the climate change.... because they work for people, they just give without charging and CFU also gives us, but if we go to Golden Valley, they make their own nursery then we go and buy plants

E01 - 1044 So, you are saying that you buy some and are just given others?

P00 - 1045 Yes

E01 - 1046 Okay, okay let us say you buy or you are given, what else is needed? So, step one you said that you go to these organizations, you get if it's seed or plants and bring them home then what?

P22 - 1047 So, when we bring that seed they give us some plastic papers where we should plant it.

E01 - 1048 Okay

P22 - 1049 We put soil which has manure

E01 - 1050 Yes

P22 - 1051 Then you put in the plastic paper but before that you need to wet the soil, after that you put in that plastic paper and when it is full that is when we get the seed and plant, like when we talk of the Musangu seed, you need to cut it on top because it takes time to germinate, and when cutting, we use the nail cutter or even just rub it on a stone, then plant.

E01 - 1052 Okay

P22 - 1053 Yes

E01 - 1054 So.....

P22 - 1055 Then from there

E01 - 1056 Yes

P22 - 1057 We just give them, 5 weeks to be in the nursery then they will be ready to be planted.

E01 - 1058 Okay, now in short do we all know that knowledge that he has explained?

P00 - 1059 No, we do not know it

E01 - 1060 So, what is needed?

POW - 1061 It is to learn

E01 - 1062 So, I asked whether we are all aware of what he explained; then they said that they are not really aware of it.

E02 - 1063 Okay

E01 - 1064 Then I asked what we need and they said that it is knowledge. Then that knowledge meaning that you go to get plants from there or if it's

from DAPP and then after that, that is when you will need knowledge - is that what you said?

P14 - 1065 We need to learn first before we go to DAPP

P0X - 1066 *arguing in the background*

P14 - 1067 Sorry I was too fast, so before we look for seed we need to learn first just like the way we are learning here after learning we look for seed then we plant.

E01 - 1068 Okay

P14 - 1069 Yes

E01 - 1070 So, you are saying first its knowledge?

P00 - 1071 Yes

E01 - 1072 Then after knowledge that is when you go to get the seeds or the plants?

P00 - 1073 Yes

E01 - 1074 Okay

E02 - 1075 Who gave them knowledge?

E01 - 1076 Yes, where do you get the knowledge from?

P14 - 1077 From the people, just like the way we are sited here, we have learnt already

E01 - 1078 No, knowledge.... because this is knowledge about planting what....

P14 - 1079 Trees

E01 - 1080 Okay

P14 - 1081 Because here we are learning that we need to plant trees

E01 - 1082 Yes

P14 - 1083 Now the way we are learning how to plant trees..... we should learn how to find them

E01 - 1084 Yes, now where does this knowledge come from? Who is going to teach you how to plant trees so that you tell them to say what you want is to learn how to plant trees, the knowledge on how to plant trees..... here do you go?

P16 - 1085 We will come here to **P22** because he has the knowledge

E01 - 1086 Okay

P14 - 1087 Just the way we are in groups and like the way you asked us to say did you sit before.... now we will start sitting.

E01 - 1088 Who else gives this knowledge where you can find it, where you get it

P24 - 1089 CFU..... when they call farmers, they teach about these lessons

E01 - 1090 Okay, yes but the CFU gives mainly the Musangu tree?

P00 - 1091 Yes

E01 - 1092 Lessons about Musangu?

P24 - 1093 Yes

E01 - 1094 Okay

P24 - 1095 Jatropher as well

E01 - 1096 Also, Jatropher?

P00 - 1097 Yes

E01 - 1098 Okay, where else can we get the knowledge? What of these other organizations, don't they give knowledge?

P00 - 1099 They do

E01 - 1100 But why are you not talking? Did we make a mistake to have a break?

P00 - 1101 *laughed*

P14 - 1102 Yes, maybe the cups are too full (jokingly)

P00 - 1103 *laughed*

E01 - 1104 Yes, because you have stopped talking

P00 - 1105 *laughed and passed some comments*

E01 - 1106 Because it is like the knowledge is just from CFU

P22 - 1107 We said from CFU, DAPP, and Climate Change

E01 - 1108 Okay, CFU, DAPP, and Climate Change. Okay so you are saying having knowledge is number one, then number two you get seed, after that you plant

P00 - 1109 Yes

E01 - 1110 then? Yes

P15 - 1111 the second is to plant

E01 - 1112 then that's all?

P15 - 1113 next is to take care of them so that they don't get burnt with the fire

P19 - 1114 here it is

E01 - 1115 so.... give her so that she talks through that recorder

P16 - 1116 here it is

P15 - 1117 we need to take care of them so that they don't get burnt with the fire

E01 - 1118 managing them so that.....

P15 - 1119 they don't get burnt

E01 - 1120 with fire, okay so.... okay give him

P21 - 1121 the method of planting trees

E01 - 1122 okay

P21 - 1123 the first thing we will have the knowledge from the organizations we have mentioned.

E01 - 1124 okay

P21 - 1125 the next thing is, when they give us the seed, we need to put them on the nursery

E01 - 1126 okay

P21 - 1127 from there we need to look for land where we can plant our trees and that place....

E01 - 1128 yes continue

P21 - 1129 that place needs to be prepared if it's digging basins, we did the basins, if it's applying manure we should get animal manure and apply. After applying animal manure then we get our plants and plant them, after planting we need to see if they need or the rains are raining or the area is it dirt if dirt we clean the area for plants to grow well and then I think on how we are going to plant them.

E01 - 1130 okay are we together?

P00 - 1131 yes

E01 - 1132 because the idea here, we said the ways.... Where do we start from to say okay where to start from is.... where do we get the knowledge and we see where we can find it? After that we get the seed using the knowledge we prepare where we want to plant our trees. And after planting the trees then we said it's maintaining them. Okay now how can we know that here, now we have reached where we wanted, land does what..... the cup has reached where it is supposed to be, have you heard my question? I started by doing this right?

P00 - 1133 yes

E01 - 1134 now how I'm I going to know that I should stop now.... it's fine.... give him.

P20 - 1135 for us to know....

E01 - 1136 yes

P20 - 1137 our trees will grow to the level where they start giving us profit, if its trees in the field they start shedding off the leaves and when you cultivate you are able to find food. Meaning that we will know that those trees we planted have started giving us profit in our lives.

E01 - 1138 okay, that's one way he has mentioned, meaning you are talking of the trees on the.....

P00 - 1139 field

E01 - 1140 the field

P20 - 1141 The other option is that, we can plant trees at our homes or the farm. From which we will be getting some fruits to eat, fruits like bananas, guavas, lemons, and those trees can help us on the part of eating fruits. On the other part is selling if they grow, you can find profit through those trees.

E01 - 1142 okay alright, so in short you are saying that you can know when you start realizing the profit. Now what if I ask like this, how can you know..... yes, I have started selling and profit is there, now how can you know that trees are enough, I don't need to plant anymore. Have you heard the question?

P00 - 1143 yes

E01 - 1144 because here we said the cup for land is doing what.....?

P00 - 1145 it's going down

E01 - 1146 it's going down, now how can we know o say now it has done what..... It's full to say okay, now we can stop planting

P20 - 1147 Thank you, the way we can know, it's to look at the land we have

E01 - 1148 okay

P20 - 1149 if we manage to plant the whole land meaning you will know to say it's enough now and in okay now.

E01 - 1150 okay so you are saying that
 looking at the land you have
P20 - 1151 yes
E01 - 1152 okay
P25 - 1153 just to add on that
E01 - 1154 yes
P25 - 1155 if the government can help us
 putting a rule on the cutting
 down of trees
E01 - 1156 okay
P25 - 1157 these trees that are small now
 they will grow also those which
 we have planting will grow.
 When those we have planted if
 they grow, also the government
 helping us with the rule to
 prevent the trees, meaning that
 the forest will be okay and we
 will know that rains will be okay
 now.
E01 - 1158 okay, okay, okay maybe there
 is some with some additions?
 Our mothers what of firewood,
 charcoal don't you burn?
P15 - 1159 we just fetch firewood
E01 - 1160 now here we want to look
 at.....you want to say
 something?
P15 - 1161 no
E03 - 1162 just say what you are talking
 about
E01 - 1163 yes, just say it
P16 - 1164 she is talking about the phone
P14 - 1165 I think in this program we
 should be putting rules, you
 have started making your own
 meeting again. I thought you
 are contributing to this, now you
 are talking about the phone
 which you are always with.
E01 - 1166 yes, so let's look.....we have
 seen the options, right?
P00 - 1167 yes
E01 - 1168 number 1 having knowledge. 2
 you get the nursery, 3 you
 prepare, 4 you plant, 5
 management, and then you will
 know that you have reached the
 point you want through realizing
 profit from your plants and also
 according to the place you do
 what?
P00 - 1169 you have
E01 - 1170 yes, you as well look at the land
 to say how the growth of the
 trees is so that these which are

small they should grow. In
 short, I think that's where we
 have reached, now the question
 am asking is that what of when
 you look at the cup..... can
 you get this one down
P00 - 1171 talking in the background
E01 - 1172 just leave it just like that, okay
 give him, so now we want to
 look at this option you have
 mentioned here, but I beg you
 not to get lost, we have seen
 that before the break, we saw
 what can be done?
P00 - 1173 yes
E01 - 1174 Now the other one, we want to
 look at the steps so that when
 you want to start you know to
 say this is where I will start from
 and go to this, from this to this,
 which are needed so that I
 manage to do these. That's
 where we are; now we want to
 look at these steps we have out
 here. What effect do they have
 to our cups, have you heard
 where we are?
P00 - 1175 yes
E01 - 1176 yes, because there are steps...
 give me the cups. There is a cup
 for inputs, implements and what
 is here, that's what is there
 right?
P00 - 1177 yes
E01 - 1178 yes. There is a cup for cash,
 then there is land, then on this
 one there is food available at
 home, yes then there is
 livestock, there is livestock....
 okay we put water also
P15 - 1179 yes, because water is
 important
E01 - 1180 okay, the water then there is
 produced food. Now we want to
 look at things and when you
 choose that option to do you
 should know that is has some
 effect on the other cups. Let's
 not just look at it to say me I will
 just do this without seeing how
 it will affect the other cups, now
 we want to see the option we
 have chosen, you started
 buying going to the organization
 and you acquire knowledge,
 after that if its buying, you buy

or if they give you plants, you are given. So, these options, how are they going to affect these cups or maybe let's start bon cash, if a person does this in future how is cash going to be?

P15 - 1181 it will increase

E01 - 1182 you will increase, explain.... I there a bottle of water

E02 - 1183 no, no, not my bottle

P00 - 1184 laughed

E01 - 1185 yes, pour some water if it will add.... or where are the pins...wait ok just put yaah anyway but.... so meaning this option of planting trees in future it can add on the cup for cash, do we agree?

P00 - 1186 yes, in which way and if we agree, where there is a green pin meaning it is increasing. Here it has added, now explain how it increases when I plant the trees.... ooh is this the recorder or it's the backup

E02 - 1187 no, that the one for backup

E01 - 1188 yes

P21 - 1189 the option of tree planting can add on the cup

E01 - 1190 the cup yes

P21 - 1191 because the trees that are being planted here we find that they are not just trees that will be standing idol, it's about trees that will benefit us like, selling fruits that they bear

E01 - 1192 yes

P21 - 1193 so that when you sell they increase the cup for cash. From there these trees hold the air thereby improving the rains which in turn gives us money.

E01 - 1194 you stop there..... you said trees increases rain?

P21 - 1195 yes

E01 - 1196 okay you can pour some more water on the cup for water.... ooh it is on this one. So, meaning here they do what?

P00 - 1197 they increase

E01 - 1198 they increase...yes

P21 - 1199 from increasing the water, these same trees increase on the part of food,

E01 - 1200 yes

P21 - 1201 because if you have water, you can manage to produce food because every crop needs water

E01 - 1202 yes

P15 - 1203 you increase the cup....it is just increasing not feeling completely

E01 - 1204 yes, it's just increasing the cup not feeling it completely

P14 - 1205 where is it improving?

P15 - 1206 it's here on food available

P14 - 1207 okay on food available

E01 - 1208 yes.... okay because this one, it is just the same, he said if it rains this side meaning that the farming produces food due to the rains being there

P21 - 1209 again, the same tress improves this side on farming

E01 - 1210 yes

P21 - 1211 yes, because when we have rains that's when we farm

E01 - 1212 okay

P21 - 1213 yes

E01 - 1214 okay you can add, what about... okay.... yes

P21 - 1215 again, these trees do add on inputs

E01 - 1216 yes how?

P21 - 1217 in that when we sell the fruits we get cash and then use that money to buy inputs

E01 - 1218 okay so you get cash after selling some fruits and buy inputs?

P21 - 1219 yes, we buy inputs so that you find food

E01 - 1220 okay

P21 - 1221 yes

E01 - 1222 yes

P21 - 1223 again, these same trees on livestock, they add

E01 - 1224 okay, explain

P21 - 1225 after selling the same fruits, the money that you get...

E01 - 1226 yes

P21 - 1227 the same cash you find you can buy chickens, goats...

E01 - 1228 okay so the same cash you can buy....

P21 - 1229 goats

E01 - 1230 yes, goats or anything else.... you can increase the cup

P21 - 1231 let me leave the floor for **P19** to add

E01 - 1232 someone else to pick it up from where he has left it
P21 - 1233 these same trees, after selling
and or maybe they manage to hold
P19 - the air so that it can rain
E01 - 1234 yes
P21 - 1235 so that you can produce hence managing having enough food...
E01 - 1236 yaah.... maybe there is one with an addition to make, you wanted to add...you bring the recorder and give her
P14 - 1237 again, the same trees... to add on the same, they drop leaves which are used as manure and produce food
E01 - 1238 you repeat that one.
P14 - 1239 these same trees shed off the leaves which is manure in the field, this makes the crops grow well
E01 - 1240 okay
P14 - 1241 yes
E01 - 1242 so, manure then.... okay
P14 - 1243 yes
E01 - 1244 okay now, what of the trees we are talking about.... what kind of trees aaaah..... the trees, you said there those trees that drops manure, other trees for selling and again there are other trees.... you mention what trees are we talking about
P15 - 1245 Musangu
E01 - 1246 ooh Musangu tree, what is it used for?
P15 - 1247 it is for manure
E01 - 1248 okay they add manure, what other trees?
P21 - 1249 there are trees that we need to be planting so that we can feel these cups
E01 - 1250 yes
P21 - 1251 the first one is the Musangu tree that they have already mentioned
E01 - 1252 yes
P21 - 1253 when the Musangu trees have fully grown they shed off the leaves that in turn adds manure to the soil
E01 - 1254 yes
P21 - 1255 from there we have trees that produce quavers, lemons, oranges...

E01 - 1256 yes
P21 - 1257 bananas
E01 - 1258 yes
P21 - 1259 From these trees, we find fruits that we can use for selling to find cash and also for food.
E01 - 1260 okay
P21 - 1261 then we have blue gums, you can plant and sell, people can be using on crops and find cash from this.... also from it.
E01 - 1262 okay
P21 - 1263 yes.... these are the trees I'm talking about that can help to feel these cups.
E01 - 1264 okay.... then aaar.... there are, is there another way of doing what.... the way this option reduces the cups to say the cups are reducing to say if you do this. If you follow this option the cup will go down. We have seen that this cup is affected this way if you follow this step right. Now is there a way that this step can reduce the cups or maybe they will be full. Have we heard the question?
P00 - 1265 yes
P20 - 1266 we try on this one
E01 - 1267 okay
P20 - 1268 eeeh when we come to tree reducing the cups, if you do not take care of them they will not benefit you
E01 - 1269 okay, yes
P20 - 1270 again, because there are no trees around, the same trees you cut them down for firewood
E01 - 1271 okay
P20 - 1272 in the kitchen, so that you can be cooking food, that way also can be used, now if there are no trees, you be careless in cutting these trees meaning that the cups will be going down
E01 - 1273 okay... so you guide me, so what you are talking about is that, 1 if you don't take care of them meaning that the cups will go down?
P20 - 1274 yes
E01 - 1275 okay, 2, where I didn't get you clearly, cutting down trees for firewood, if you do not manage the trees properly it also

reduces the cup. Is that what you said?

P20 - 1276 yes, that's it

E01 - 1277 have you gotten those two areas

P00 - 1278 yes

E01 - 1279 to say if you do not care for them, this same step for, if you don't take care of the trees, if there is no care meanwhile you are cutting for firewood

P00 - 1280 yes

E01 - 1281 then the net is that it will go down

P00 - 1282 yes

E01 - 1283 okay, yes what other ways? Okay maybe you have a question **E02** or a comment but generally the two threats is the firewood if they care for the tree.

E02 - 1284 okay

E01 - 1285 and also, if there is no replanting of them, those practices will drain the cups. Okay any comments?

E02 - 1286 no

E01 - 1287 you have seen that the most important lesson we wanted to look at is that side, we said planting of trees, now we have seen the options of going to CFU. Is it going to make your cup go down no, having knowledge is it going to make your cup go down? No what of planting trees no, what of caring of trees so that they are okay, meaning that this option we have used it will help us in future so that our cups can do what.... I think we are together on that one.

P00 - 1288 yes

E01 - 1289 now if we go to.... to what.... no, it's okay. Now what I want to ask from what you have seen, what of if we get one again, there we were saying that livestock selling, to say you buy then you go and sell the cow or the livestock or if it's goats or chicken because of life, the rains do what..... it's difficult but you want your cup to be full. If you have livestock you can get and sell. Now the question

is that, what steps or ways can you take so that you are on that step of selling so that you are on that step of selling so that also the cup can be going up, have we heard the question? Step number 1, the other options was tree planting, the second option was selling livestock, and now for you to have.... have you heard the question?

P00 - 1290 yes

E01 - 1291 yes, so we are going to the next one..... pardon

E02 - 1292 okay

E01 - 1293 yaah

E02 - 1294 to be done together?

E01 - 1295 yes, I think let's do it together

E02 - 1296 okay

E01 - 1297 in case it brings the dynamics here

E02 - 1298 okay sure

E01 - 1299 yaah, so we are looking at the livestock, we said that time has changed, rains are also reducing but we need to make sure that the cups for food at home should be what... should be there and then we said that one way we can use to fill the cup is selling livestock. So now we want to see what is needed so that everyone here may manage to use livestock, so number 1, where do we start from so that you manage to sell livestock.... yes, our mothers there...yes to start....

P00 - 1300 laughed

E01 - 1301 bring

P00 - 1302 laughed

P14 - 1303 it's coming here, how you can start making plans on how to sell, you should start first by planning

E01 - 1304 okay

P14 - 1305 now if I sell this cock, how much cash I'm I going to have?

E01 - 1306 okay

P14 - 1307 from there, what do I buy from this cash?

E01 - 1308 okay

P14 - 1309 is the money going to be enough or not?

E01 - 1310 okay

P14 - 1311 that's all then you sell now

P00 - 1312	laughed				because those things need to be dipping and other things
E01 - 1313	yes				
P20 - 1314	if we come to livestock, for you to reach the point of selling livestock			E01 - 1335	so, dipping
E01 - 1315	yes			P19 - 1336	yes, like cattle
P20 - 1316	sometimes it happens that you have a problem and it happens that it's a long distance maybe in southern province			E01 - 1337	okay so dipping is one care
E01 - 1317	yes			P19 - 1338	yes, then on the chickens also you build for them where to be sleeping in, the food should be available.
P20 - 1318	now you will look at all the livestock and see to say if I say a goat is the money going to be enough, meaning that you go for cattle and see which one can be sold			E01 - 1339	okay
E01 - 1319	yes			P19 - 1340	like goats it's the same just like that, that's when you can make a program of selling because if you take good care of them they can be more and you can sell.
P20 - 1320	so, I will look at the cow which is old and sell that			E01 - 1341	okay, so him he has given the idea to say what is supposed to be done is taking care of them, now before taking care, like for me I don't have, where do I start from so that I see to say the beginning is this, from this I go to this, from this to this, from here I go there, have you heard the question?
E01 - 1321	yes			P00 - 1342	yes
P20 - 1322	Then you can get that cow and sell it so that you use the cash on that problem. If it's a funeral you have, you use transport after selling that cow.			P21 - 1343	the stages for us to start selling, the first thing we need to find capital
E01 - 1323	now, mmmm I have heard on all that, now what are you supposed to do so that you reach an extent that you can manage to sell livestock, are we together on that one?			E01 - 1344	capital, now this capital, where can we find it?
P20 - 1324	you have taken us round.			P21 - 1345	this capital can be found from the food produced
E01 - 1325	because the question is that, can you sell something which you don't have			E01 - 1346	okay
P00 - 1326	no			P21 - 1347	because we are preparing the future
E01 - 1327	so, there is something which you are supposed to do for you to sell that livestock or that cock			E01 - 1348	okay
P00 - 1328	yes			P21 - 1349	yes, from the produced food, we will get some and sell
E01 - 1329	meaning there is something you did, so that you have what... and that's what we.... have you seen this step? For you to have trees, you start selling bananas, meaning there is what.... there is where you started from			E01 - 1350	okay
P00 - 1330	laughed			P21 - 1351	we get cash and buy one cow or if it's a goat, if it's a cow we should build a kraal where it will be sleeping
E01 - 1331	are we together now?			E01 - 1352	okay, so you are saying that from food produced you sell then cash you buy
P00 - 1332	yes, we have been opened up			P21 - 1353	you buy a cow
E01 - 1333	yes			E01 - 1354	you buy livestock then?
P19 - 1334	if you have livestock and you are not taking good care of them, you can't sell in future			P21 - 1355	after you have bought that cow
				E01 - 1356	yes
				P21 - 1357	it needs a kraal, after you have done that it needs food, so you need to be taking it for grazing
				E01 - 1358	yes

P21 - 1359 since it's a cow it can be attacked by diseases, so you need to be dipping it.

E01 - 1360 okay.... Yes

P21 - 1361 that cow through taking care of it, it will start reproducing

E01 - 1362 okay

P21 - 1363 when it has produced, they will be many at home.

E01 - 1364 okay

P21 - 1365 when they are many you can be helping yourself to say let me sell this livestock so that the money gotten is used to help myself

E01 - 1366 ooh...okay

P21 - 1367 yes

E01 - 1368 then...now...have you heard his explanation

P00 - 1369 yes

E01 - 1370 he started to say, when you have harvested well, you sell then the money....

P15 - 1371 you used to buy a cow

E01 - 1372 you come and buy if it's a cow or a goat. Yes, then from there you need to take care of where it lives, feeding it, dipping managing it well, then they produce, when they produce meaning that the cup that side doing what?

P00 - 1373 increasing

E01 - 1374 you have seen where he started from, he started from where?

P15 - 1375 he started from here (food produced)

P00 - 1376 he started from food produced

E01 - 1377 now is it every one of us who starts from here (food produced)

P00 - 1378 no

P22 - 1379 starting if I don't have cattle then Mr. **P21** has, I can go to him and talk to him so that we can be working together

E01 - 1380 okay

P22 - 1381 after that, we start working together such that he comes to plough for me

E01 - 1382 yes

P22 - 1383 after he has ploughed for me then I produce food

E01 - 1384 yes

P22 - 1385 I plough I have food, after that I sell some and I leave some for food

E01 - 1386 okay

P22 - 1387 yes

E01 - 1388 so, some of it you sell and other remains

P22 - 1389 for food

E01 - 1390 yes, for food, then?

P22 - 1391 after I have food, the money that remains I take it and buy a goat or a cow...ok let me just go to cattle I buy a small cow, then again, I continue with Mr. **P21**

E01 - 1392 so.... you buy one, then you come back to the same circle

P22 - 1393 yes, I come back to **P21** -, we come and plough, after that maybe the production is sound, again I buy another cow now a big one

E01 - 1394 okay

P22 - 1395 then by that time the one I bought last would have grown

E01 - 1396 ooh so the second round again you buy another one

P22 - 1397 yes

E01 - 1398 okay

P22 - 1399 then from there, aah seeing that now I have a pair of oxen, I tell **P21** that you have helped me my friend, now I can start working alone

E01 - 1400 okay, after the pair of oxen is complete, the hiring ends

P22 - 1401 because I have bought mine

E01 - 1402 then you become independent

P00 - 1403 yes

E01 - 1404 okay..... after the pair of oxen.... okay....do we all start from cow because you have seen the examples, like this one it just started straight on cattle this one he has just **P20** us. He started by working together then when you sell maybe it is maize then you buy a small cow, do we always start from there, mothers?

P14 - 1405 you can start on chicken

E01 - 1406 yes explain, you bring the recorder

P19 - 1407 you explain just there on chicken

P22 - 1408 you cannot start on the same point, you can explain on groundnuts

P00 - 1409 laughing

P22 - 1410 don't you sell groundnuts in Lusaka at Soweto market

P16 - 1411 you explain

P17 - 1412 no, you can explain

P14 - 1413 no, you give **P18** so that she can also talk

P17 - 1414 no let the one with the recorder explain....

P00 - 1415 laughing and talking.....

E01 - 1416 you can explain

P14 - 1417 you cannot just sit quietly, it is important to at least say something

E01 - 1418 yes...you can continue

P15 - 1419 you continue with the program **POW**

E01 - 1420 where to start from. Meaning that **POW**, you don't have any desire to see the livestock increase...yes because in life....

P14 - 1421 you explain like me I have brought a cock

E01 - 1422 yes, you explain

P14 - 1423 you are failing to explain, she is listening

P00 - 1424 **laughing**

P22 - 1425 we are wasting time, me am covered

E01 - 1426 because don't forget that one day you will remain alone. Your husband will do what?

P00 - 1427 die

E01 - 1428 so, where are you going to touch, because we are helping each other.

P00 - 1429 yes

E01 - 1430 where will you start from, what can you do so that we see to say, even me on the cup for livestock, I can use this option so that I can have livestock. We all don't start from one point, each one starts on a different level but the desire is what...the same to say even me I want.... they will be improving bit by bit.... are we saying there is only.....

P00 - 1431 cattle

E01 - 1432 the ways to follow for instance you want...when you produce you buy cattle

P21 - 1433 the other option is, there some organizations like DAPP who gives goats

E01 - 1434 okay

P21 - 1435 then what you need to do is preparing where they will be living, after that they will start reproducing and you start selling afterwards, sometimes they give goats, at times its chickens.

E01 - 1436 okay

P21 - 1437 yes, when you are given chickens, when they are ready you start selling. So that's another option

E01 - 1438 okay... year.... so, all these three have come from our father's side

P17 - 1439 yes

E01 - 1440 you mothers

P19 - 1441 you have just sold a cock

P15 - 1442 let her explain how she got it....

P14 - 1443 aaar, did I say you give the recorder sure

E01 - 1444 yes

P14 - 1445 another way is that when you go to visit, they normally kill a chicken for you and it they give you a live one to say go and rear this one, don't eat that one as well when you get home. You take care of it, make nest until they are many like what I did, when they became a lot, you sell the produced cock. I have money because I sold a cock here and with that money I'm going to buy empty bags.

E01 - 1446 so, when you are given you take care of I so that it reproduces and there after you sell when they are many?

P14 - 1447 yes

E01 - 1448 if we look at these two ways, when you start working together with someone, we start with working together; we will consider these cups like we did on trees

P00 - 1449 yes

E01 - 1450 step number 1, to say me I don't have cattle but you have

and I have come so that we work together, then.... what about this step of working together with someone, what influence does it have? Let's start here on cash. Have you heard my question?

P14 - 1451 influence like how?

E01 - 1452 is this cup for cash going to increase or reduce because I have taken the option of...?

P14 - 1453 working together

E01 - 1454 yes, working together

P15 - 1455 it cannot be full because....

P19 - 1456 no use a recorder

P15 - 1457 it cannot be full because I'm working for someone unless you work extra hard with the desire to improve until the Lord blesses you, by luck the cup can be full

E01 - 1458 okay but can it add?

P15 - 1459 adding it can but it cannot the desired goal

E01 - 1460 okay

P15 - 1461 yes

E01 - 1462 so, it can add. Then what of the cup for inputs, seed, fertilizer because we have picked this option of saying you start working with someone. You continue until you reach a level where you buy a cow and the you continue until you buy another cow, now you have your own pair of oxen

P15 - 1463 now you have yours meaning that you have known that fertilizer now I have managed

P14 - 1464 it's okay working with someone as long as you have a plan

E01 - 1465 yes

P14 - 1466 here where I'm I worked with someone, now I have a cow, with these Mr. **P19** I'm going to buy another one. So, if you are working with someone, you should know what you are looking for. So here it's all about planning

E01 - 1467 okay

P24 - 1468 working with someone....

E01 - 1469 yes

P24 - 1470 it adds such that you can manage to buy fertilizer and seed. I managed to marry, buy

cattle and now I am independent because have my own cattle

E01 - 1471 okay

P15 - 1472 talking to fellow P00 in surprise of something

E01 - 1473 yes

P19 - 1474 it is trick working with someone

E01 - 1475 you can explain

P25 - 1476 on working together just like they have explained, like here on fruits, we were talking about planting. These same bananas if you don't have seed you can come and ask you to go and plant. When it produces like this one has produced, you sell and buy maybe it's a chicken, then that chicken when it produces and if there are cocks that are produced, you can get and sell so that you buy seed but you continue working with someone

E01 - 1477 okay

P25 - 1478 you buy seed from a banana

E01 - 1479 yes

P25 - 1480 there where you are working from, they come and cultivate for you, you plant that seed, and the cup will then be full if you have a plan. Without planning you can just be at the same level until the cup completely runs dry

E01 - 1481 yes, anyone with an addition to make?

E03 - 1482 yes, you can add

E01 - 1483 give him the recorder

P19 - 1484 working with someone is okay if you have good plans, some people do it so that they can increase on their labour

E01 - 1485 yes

P19 - 1486 most people can be working so that they cultivate for him a good time especially with the poor rainfall pattern

E01 - 1487 yes

P19 - 1488 but you find that they do not cultivate for him in good time such that the crops are left by rains before they mature. Can the cup be full or it can not?

P15 - 1489 it cannot be full

E01 - 1490 it cannot be full

P19 - 1491 because of what....? Because someone you are working with is a drawback, yes there are others who are good whom you can be working with and they cultivate for you in good time, like that it can be full

P15 - 1492 yes

P19 - 1493 but others will cultivate for you late such that before the crops can completely mature the rains stop. So, there are two situations on this cup, being full and a reduced cup...these two.

E01 - 1494 okay meaning so you have seen that this method you need to be very careful

P00 - 1495 yes

E01 - 1496 to say it can either make the cup full or reduce it

P14 - 1497 meaning when you see that the cup won't be full you stop

P19 - 1498 that's it

E01 - 1499 oohh... so when you see that the cup cannot be full you leave yes, and find somewhere else

P14 - 1500 oooh...

E01 - 1501 its planning that matters, there others with their own implements but it's difficult to fill the cups. Others don't have but they manage to fill the cup but other who has fail to fill the cup

P22 - 1502 okay so you are saying that planning

E01 - 1503 yes

P22 - 1504 yes, planning matters a lot

P15 - 1505 okay

E01 - 1506 they fail to find food but they have implements....

P22 - 1507 but for you to have good planning, what do you need to have?

E01 - 1508 the questions are too many

P19 - 1509 yes, because we are learning so that when we move out of this place, each one of us will know, if it's going to ask to learn from someone to say step one, let me go to find out so that even me I can have what...? I can have plan

E01 - 1510 planning...if you want to have a good plan, the first thing you need to set goals to say if you want to produce maize, you should have a reason why you want to grow maize. If you don't know, you will just misuse the money that you get afterwards but if you have a goal it means that your plan is good

E01 - 1512 okay alright.... are we together?

P00 - 1513 yes

E01 - 1514 okay...mmmm but have we seen that some options do not feel the cups, other do what?

P00 - 1515 feel the cups

E01 - 1516 there is nothing like the way we did that we start arguing, the first example you have seen, right?

P00 - 1517 yes

E01 - 1518 then this one you really need to be considerate to say, this method maybe the cup won't be full or it will do what?

P00 - 1519 it will be full

E01 - 1520 yaah.... Then we looked at planning

P15 - 1521 yes

E01 - 1522 is important maybe the last one...eeer which one.....you were saying.....

E02 - 1523 **E01**

E01 - 1524 yes please

E02 - 1525 are we going to the next option?

E01 - 1526 yes, the next option

E02 - 1527 then my question is, I seem to understand that planning is very important

E01 - 1528 yes

E02 - 1529 how do we make sure that we plan?

E01 - 1530 yes, have you heard the question, how do you make sure that you....

E02 - 1531 that you plan right

E01 - 1532 yes, have you heard the question?

P00 - 1533 no, we have not gotten it

E01 - 1534 okay, she said planning is the most important thing

P00 - 1535 yes

E01 - 1536 now what of this planning, what can you do so that your planning, you are sure that its right?

E02 - 1537 because I plan a lot of things but not all of them happen

E01 - 1538 yes, her sometimes she plans but there is nothing that does what.....?

P00 - 1539 happen

E01 - 1540 yes, but she also does what plan, so now what is needed that the plan is successful to say this plan is okay.

P20 - 1541 planning, if you make a program you should know what to do.

E01 - 1542 okay

P20 - 1543 when you make that plan, you should do it, don't just plan without doing it, but if you plan make sure that you do it and you will have what you have planned.

E01 - 1544 okay, in short have you heard what he has explained to say you should know what you want to do and you should do that which you have planned. Now mostly what makes us not to do what we have planned or what makes us to do according to the way things are planned.

P20 - 1545 what makes you do that thing is the desire

E01 - 1546 desire

P20 - 1547 yes

E01 - 1548 okay desire continues,

P20 - 1549 if you don't have cattle you should work hard so that you find what....? You find cattle. If you don't have goats, you should also work hard so that you buy that goat.

E01 - 1550 okay

P20 - 1551 meaning that's the desire to find what you want

E01 - 1552 okay yes what?

P19 - 1553 pass it that side

E01 - 1554 because you have seen her question is that maybe you can just be saying planning, planning, yes, they plan, but there is nothing which does what?

P14 - 1555 happen

E01 - 1556 happen but why?

P24 - 1557 bring it, if you plan for something,

E01 - 1558 yes

P24 - 1559 you should try by all means that you do it and by trying to do that

also lucky comes so that your plans can go through.

E01 - 1560 okay, so you are saying that if you desire, then you do it, then you will be lucky

P24 - 1561 yes

E01 - 1562 now what of if you are not lucky? You have done it but you are not lucky

P24 - 1563 meaning that thing will not go through

E01 - 1564 okay, okay alright so in other ways those are the elements and his explanation is that sometimes if you do implement everything according to the plan, if you are unfortunate it might not work out meanwhile you have done everything.

E02 - 1565 and you see what works for me if I tell someone to be checking that I really do what I said I would do.

E01 - 1566 so, for her what helps her to make sure that the plans are followed; she gives someone to be checking if it is done yes, has this been done? Yes. Has his been done? Yes. Otherwise your plan..... so, for her that's what she does, checking to say has this been done, has this one done so she gives someone. Yes, what are you saying?

P00 - 1567 discussing something though not clear

E01 - 1568 yes

P15 - 1569 I think it's just okay

E01 - 1570 oooh its okay

P15 - 1571 yes, because at times it can happen, it's just like a plan.... when making a plan of what you want to do, some do it alone and those who do it alone sometimes they end up doing wrong things but if you are two at least you can control each other to say let's do this

E01 - 1572 okay, if you are two rights?

P15 - 1573 yes, you can make something sensible maybe your friend is suggesting of a wrong thing then you control.

E01 - 1574 okay, so that why she said this is okay and what you have said

is much better to say if you are two, yes so, she agrees to say if you are two it's much better and that's why she said husband and wife you should do what...?

P00 - 1575 come
E01 - 1576 come both so that when you look at planning, it's not just what...?

P00 - 1577 one person. Because she/he can make a wrong thing
E01 - 1578 so that you help each other so that, that cup need to do what? to be full

P00 - 1579 yes, to say maybe you don't have a cow or a chicken but maybe you can start form groundnuts until if it's after 10 or 20 years people should start saying that they are the ones who have more cattle.
E01 - 1580

P00 - 1581 yes
P15 - 1582 and they will start saying that the way that person was, he was poor

P00 - 1583 laughed
E01 - 1584 okay, (*E01 talking to E02 and the group discussing as well in the back ground*). Now we want to do this, I want us to separate, each group is going to choose what is to be done and then they will write to say where do we start from.....okay we can start from here just like the way we did and then you come and explain to say...or let's say here there was budget,

P00 - 1585 yes
E01 - 1586 do you remember FISP? Maybe one can get what.... a problem for FISP to say okay what should be done is this and then we need the steps and we will ask to say that option you have chosen, how does it connect the cups, if it's the option of starting from charcoal to find cash or if you will start from groundnuts, or you start from goats

P00 - 1587 laughed
E01 - 1588 if you start from.... until you reach the....

P14 - 1589 there is nothing like POW alone but we should be mixed.

P00 - 1590 laughed
E01 - 1591 she is suggesting that it shouldn't be gender but should be mixed

E02 - 1592 really
E01 - 1593 yes, okay
P00 - 1594 dividing themselves
E01 - 1595 so, let's be in two groups then we.... who are going to get because you said we need to put rules do you remember that we need rule on trees to...

P00 - 1596 discussing
E01 - 1597 the one for livestock we did it here, then what of business.... what of business? You get for business

P00 - 1598 yes
E01 - 1599 okay they will get for business then you get break making, no, no, no

P00 - 1600 discussing something in the background
E01 - 1601 becoming land lords, the ways of how you will be what land lords

P00 - 1602 land lords to say you have houses in Chibombo for rent so that even if it doesn't rain, but the cash is doing what?
E01 - 1603 it's coming

P00 - 1604 yes
E01 - 1605 yes
P00 - 1606 discussing in the background
E01 - 1607 E01 also talking to E02
P00 - 1608 they are trying to balance themselves

E01 - 1609 said something though not clear

GROUP DISCUSSING NOW (Group 1 – G01)

P19 - 1610 come closer you are afraid of your father?

P22 - 1611 who is that one who is scared?
P16 - 1612 put it on this
P22 - 1613 okay ours is business, right?
P00 - 1614 yes
P22 - 1615 how are we going to start it?
P19 - 1616 we will start with capital
P22 - 1617 we will start with capital and where do we get the capital from?

P16 - 1618 where to get capital?
P22 - 1619 yes
P19 - 1620 write capital first here because that's the beginning
P22 - 1621 capital

E01 - 1622 if you still need some more paper tell us, we will give you but what we want to see is how you can start and where do you start from, and then you can even do two parts to say there are some people who don't have and where can they start from, also there are those who have and where can they start from. Yes, bit by bit until you reach the desired goal

P22 - 1623 so, let's see, are there some things that we can do?

P16 - 1624 what we can do?

E01 - 1625 but let's remember that the idea is for the cups to get full

P16 - 1626 we will start by getting capital

P22 - 1627 so, we get capital

P16 - 1628 yes, if you produce food, you get some you sell

P22 - 1629 from produced food okay

P16 - 1630 after harvesting that you get, you sell

P19 - 1631 it's just a suggestion because there are different and here they want to record

P16 - 1632 after selling maybe you get k500 then you take it into business

P22 - 1633 okay, we said first its food produced, and then from food we get capital

P16 - 1634 yes, capital and after capital you maybe get a k500 or a k1000

P22 - 1635 okay cash and how much did you say we will get?

P16 - 1636 we get maybe a k1000 from the sold produced and that's when we start here

P22 - 1637 so, you are saying we get and how much is it in total

P16 - 1638 okay, let's say we get a k1000

P22 - 1639 We get k1000 right?

P16 - 1640 yes

P22 - 1641 k1000 okay and we will start a business of how much?

P16 - 1642 we start a business with k500 and then the other one you use at home.

P22 - 1643 okay, business here, you start with k500

P16 - 1644 yes

P22 - 1645 then what do we order or buy?

P16 - 1646 what do we get?

P22 - 1647 okay we buy things for k500. Yes, let's contribute

P16 - 1648 yes, here we buy two goats

P22 - 1649 okay two goats

P16 - 1650 yes

P22 - 1651 from k500

P16 - 1652 I buy them at k500 and then I go to sell at k400 each

P22 - 1653 then you sell them

P16 - 1654 meaning I will have a k300 as my profit

P22 - 1655 then we come to sell

P16 - 1656 or maybe let's put 3 goats

P22 - 1657 okay

P16 - 1658 yes, so that we start with this small number

P22 - 1659 then how much do we sell them?

P16 - 1660 we sell them at k350 each

P22 - 1661 k350 each and we will have k700 and we sell them maybe at kasumbalesa

P19 - 1662 now what of transport costs?

P16 - 1663 yes transport

P22 - 1664 we will get from the same and we should make sure that has is made profit?

P16 - 1665 yes profit

P19 - 1666 so here you should do this

P16 - 1667 yes, so that we find transport

P22 - 1668 no let's do this; let's find the price you mentioned first because the price is the guide. Let's say you buy each at k250 and sell at k500 each, you have seen, right?

P19 - 1669 so, its k500 each

P16 - 1670 let's put the same k500 as a roughly price so that transport is catered for.

P22 - 1671 yes, k500 each so that when we remove transport costs then we will remain with that amount, so we should know the amount needed for transport

P16 - 1672 yes, also for food

P22 - 1673 yes, also for food and we put the money aside

P23 - 1674 so that's business?

P16 - 1675 no, the cash for business is used already

P22 - 1676 so, we find k1000 after selling the goats at k500 each

P16 - 1677 and now let's say transport cost is k20 per goat or k30 each

P22 - 1678 okay we remove k30 per goat

P19 - 1679 yes, per goat
P22 - 1680 then we say these are the expenses
P16 - 1681 yes
P22 - 1682 then we say k30 per goat. Then.....
P16 - 1683 food
P22 - 1684 so, we say this is our starter, right?
P16 - 1685 yes
P22 - 1686 total, lunch, and refreshments
P16 - 1687 add to the transport cost
P22 - 1688 okay transport cost
P16 - 1689 yes
P22 - 1690 okay and how much is that?
P16 - 1691 k60
P22 - 1692 okay k60 and then what else?
P19 - 1693 lunch
P22 - 1694 okay lunch, now what we are doing here is it for going and coming back?
P16 - 1695 it's just goats, right?
P22 - 1696 yes, just goats
P16 - 1697 yes
P22 - 1698 so, we say going and coming back k60
P16 - 1699 I think we can just get half
P19 - 1700 now when going as a person do you pay?
P16 - 1701 no, we don't pay it's just for coming back and then lunch
P22 - 1702 yes, then lunch how much should it be?
P16 - 1703 lunch should be k80 so that you buy drinks and other food stuffs from morning till evening
P22 - 1704 Okay and then how much is the total?
P19 - 1705 that's k220
P22 - 1706 k220 right?
P19 - 1707 yes
P22 - 1708 so, we remove from k1000
P19 - 1709 yes
P22 - 1710 k1000-k220=780. Then how much remain?
P19 - 1711 nothing because the total has remained k780
P22 - 1712 okay, that's good, so we have found that its k780 when we remove the expenses
P19 - 1713 yes
P22 - 1714 so, let's subtract so that we see the profit
P16 - 1715 yes, we subtract k500
P22 - 1716 yes, we find profit so we say k780-k500

P16 - 1717 we are learning here
P19 - 1718 he will come he is busy
P22 - 1719 calculating now, so this is the..... right?
P19 - 1720 yes k280
P22 - 1721 then now
P16 - 1722 so now we go to someone who doesn't have anything and where does that person start from?
P22 - 1723 have we finished on this one?
P19 - 1724 when it's time for explanations, we will be helping each other.
P22 - 1725 we explain that we started with this amount and we got this
P16 - 1726 it's to say that we started with beans
P19 - 1727 where have we gotten that one, from k500?
P22 - 1728 from k500, we buy two goats after that we sell them, after selling they give us how much?
P00 - 1729 it gives us k1000
P22 - 1730 it gives us k1000, the money... the expenses we....
P19 - 1731 then can't we put even this side, for food, this side on food produced because we have produced our own food
P16 - 1732 we reserve a k500 for food
P19 - 1733 where is it?
P16 - 1734 we have not written it just mentioned it that we get from k1000, that's the reminder which is to be used at home. While the other k500 should continue circulating in the same business
P00 - 1735 yes sure
P19 - 1736 where is the other k500 so that we indicate as well here?
P16 - 1737 the k500 for home use....
P22 - 1738 you are saying we should indicate it here?
P16 - 1739 the balance
P22 - 1740 okay balance here.... balance is k500
P16 - 1741 then you said we start again for a person who doesn't have capital
P19 - 1742 talking about one who doesn't have.... Where to start business
P22 - 1743 okay
P19 - 1744 how can he/she start the business?

P16 - 1745 because here it was found through growing soya beans first..... we produced and then we came here on capital. Now, the one who doesn't have.....

P15 - 1746 doesn't have anything to start a business, how does he start?

P16 - 1747 the one without anything, don't have cattle to use

P19 - 1748 he will start from

P0X - 1749 start by getting from someone on credit

P00 - 1750 laughing at the idea

P24 - 1751 uncle, he is supposed to start with a chicken, the smallest.

P19 - 1752 yes, starting from a chicken then....

P22 - 1753 how does he arrive at having a chicken for him to start from there?

E01 - 1754 because those who don't have here on food produced, they cannot take to cash because maybe even the food they have harvested is not enough. So, there is nothing to sell that's why he is asking that what about those...

P15 - 1755 that doesn't have

P16 - 1756 that doesn't have

E01 - 1757 yes, what way can they use?

P22 - 1758 if it like that then let's go to this

P19 - 1759 he can start with piecework

P22 - 1760 piecework

P19 - 1761 those who cannot get a credit they can do piecework; they give him/her a chicken or something else

P22 - 1762 what did you say he should do?

P16 - 1763 we said he can either get money on credit or do a piecework

E01 - 1764 you can also put piecework and.....

P19 - 1765 and getting money on credit from AGORA

E01 - 1766 yes

P22 - 1767 okay piecework

P16 - 1768 even from OSAWA, one was just from telling us that she went and got money on credit from OSAWA and piecework too

P22 - 1769 piecework.... then you are saying what kind of work did he do on this piecework?

P16 - 1770 if it's a man he cut one ox-cart of firewood

P22 - 1771 ooh...we just put that firewood, he went and cut an ox cart of firewood

P16 - 1772 yes

P22 - 1773 then he was given how much?

P16 - 1774 these days an ox cart of firewood is k20, from that k20, maybe he cut 10 ox carts

P19 - 1775 meaning he made about k200

P22 - 1776 okay we put, one ox cart equal to k20

P16 - 1777 yes

and P19

P22 - 1778 then you said how many ox carts did he cut?

P16 - 1779 10 ox carts

P19 - 1780 10 ox carts

P22 - 1781 he worked cutting 10 ox carts and he came to earn how much?

P19 - 1782 k200

P22 - 1783 k200 then now

P16 - 1784 then from that he comes and say let me not just sit, let me start a business, so k100 for food, k100 let me buy flour and sugar then he starts a business.

P15 - 1785 even chickens he can buy

P22 - 1786 where are we going to write this from?

P19 - 1787 even from here

P22 - 1788 then he has k200

P16 - 1789 he says let this k100 be put aside it's for food

P22 - 1790 okay k100 for food... food right, then the k100 that has remained?

P16 - 1791 takes it for business, you buy flour, sugar, and salt

P22 - 1792 the k100 that has remained goes for business, for what business.... so now what kind of business is he going to start with this k100?

P16 - 1793 it is just fritters here

P19 - 1794 what about chickens?

P15 - 1795 what about chickens?

P16 - 1796 chickens, how many chickens?

P19 - 1797 even chickens, how much do you sell one chicken?

P16 - 1798 one chicken is k30, so you will only buy 3 of them

P19 - 1799 you have never found a chicken at k25 one
P00 - 1800 laughing
P16 - 1801 you can still put one chicken at k25 each
P15 - 1802 even for k25 or k30 are found
P16 - 1803 you can put just like that
P19 - 1804 there are those for k25 which they go sell at kasukwe. There others who do that
P22 - 1805 you go to sell how many?
P19 - 1806 4 chickens
P16 - 1807 yes, let's put 4
P22 - 1808 okay...4 chickens
P19 - 1809 even going to lukanaga swamps, how did Mumba do it?
P16 - 1810 yes, even going there (doing business of selling fish is what they are talking about)
P22 - 1811 4 chickens.... each you said k25
P16 - 1812 yes, each at k25 so that we have 4 chickens
P22 - 1813 okay, then how much will one chicken out these four costs?
P16 - 1814 we sell at kasukwe k50 each
P22 - 1815 you look for someone to go and sell
P16 - 1816 so, 4 chickens at k50 each, how much all together?
P19 - 1817 k200
P16 - 1818 k200, yes again it goes back this side
P22 - 1819 sell 4 chickens.... You said selling chicken at how much k50? How much all together?
P16 - 1820 k200
P22 - 1821 so, you said 1 is what?
P16 - 1822 its k50
P22 - 1823 okay, k50 each chicken and the total money is k200, that's so?
P19 - 1824 laughs at..... that's all
P22 - 1825 oh, no, then we come here, he started with what?
P00 - 1826 no here the program ends
P16 - 1827 okay we now come here, he comes to this
P22 - 1828 so, we are saying that when we went to sell, he did not incur some expenses?
P15 - 1829 he went with a bicycle
P19 - 1830 he drunk some beer
P16 - 1831 yes, he drunk some beer
P22 - 1832 it was just lunch
P15 - 1833 it is just k20 for beer
P22 - 1834 okay, other expenses.....

P16 - 1835 lunch
P22 - 1836 okay, how much for lunch
P15 - 1837 k20
P19 - 1838 k20
P22 - 1839 k20.... k20 then....
P16 - 1840 he has problems so he should not eat too much money
P19 - 1841 yes, he is going through hardships this time
P22 - 1842 we said, we started with how much
P16 - 1843 with k100
P22 - 1844 with k100
P19 - 1845 is it not that we are getting from k200 so that we find the profit
P16 - 1846 yes, we remove the k100 he started the business with.....
P22 - 1847 oho we are adding?
P16 - 1848 yes, then the expense the money he used for lunch; he remained with k 180, then the order he is supposed to remove some
P19 - 1849 the profit is k80
P16 - 1850 so, profit is k80
P22 - 1851 so, you are saying that we get k200 right?
P16 - 1852 yes
P22 - 1853 k200, we started with k100 right?
P16 - 1854 yes
P22 - 1855 100+20=120, then you said 80, right?
P19 - 1856 yes
P22 - 1857 profit is equals to k80... is there anything we have left out?
P19 - 1858 nothing that's all
P16 - 1859 let's plan for another one, its better...
P19 - 1860 like what now?
P16 - 1861 what we are going to look at?
P19 - 1862 yes, for trees
P00 - 1863 laughing
P15 - 1864 yes, one for trees
P16 - 1865 yes
E01 - 1866 you should be done in 5 minutes time, you can continue
P19 - 1867 let's talk because the recorder is recording
P16 - 1868 let's start from this side.... so, we can go back through what we have been doing so that we can....
E03 - 1869 if you need another paper we can give you
P16 - 1870 no, 5 minutes is not much

P22 - 1871 haa, people here.... oh, okay I have seen now
P16 - 1872 okay
P22 - 1873 I thought we have ended on this one meanwhile we come here, I have seen the k500 we started with. It was the starter
P19 - 1874 the profit is not this one here
P00 - 1875 yes, it is this one
P22 - 1876 we came and found this much
P16 - 1877 then you take it back in business you buy at k120 each we get capital and put.... you get capital which is k500 and put,
P16 - 1879 again, remain eating this one
P19 - 1880 no, you buy something even a stool you buy
P22 - 1881 no, we don't like that, before you have generated a lot
P00 - 1882 laughing
P22 - 1883 you first make sure you generate a lot of profit, so this one you can reserve so that maybe you run on loses, this one must be kept intact
P16 - 1884 yes, you keep this one, and then you add with this one, you also do piecework
P19 - 1885 nothing more, 5 minutes
P16 - 1886 it's okay, 5 minutes is too little
E03 - 1887 yes, you can explain....
P22 - 1888 it's done now
P15 - 1889 am being called, let me go and answer
P16 - 1890 yes, you go and answer
P15 - 1891 you call me when it's time for explanations
P16 - 1892 yes, you come back so that we explain
1893 (.... Nothing is happening as everyone is waiting for 5 minutes to elapse....)
P19 - 1894 you who was writing, you know the stages so you're going to go through what we have been discussing... laughing
(Group discussions end)
E01 - 1895 okay we have all finished, right?
P00 - 1896 yes
E01 - 1897 so, what are we going to do? Each group is going to explain to us.... they will teach us the same way we have been doing it, now it's your time to teach

everyone here. Each group will be given limited time to teach while the others learn.....

Group 1 (G01) is about to start explaining

P19 - 1898 let the one who was writing explain
E01 - 1899 or maybe we move in the shade?
E03 - 1900 yes, let's move
E01 - 1901 ok maybe we do this, this is group number what, Group 2 (G02)?
G02 - 1902 yes
E01 - 1903 maybe let's start with group 1, let's hear from group 1 they teach us but we should not leave our papers.....
P00 - 1904 ooh we learn as group
E01 - 1905 yes, so that when they finish explaining here, we go where?
P16 - 1906 we go to group 2 where they were discussing the issue of landlords
E01 - 1907 yes
E02 - 1908 from the landlords group?
E01 - 1909 no from the business group..... yaah..... you can start explaining
P22 - 1910 aah... what we have done here is that we cultivated, after that we found k1000 cash, from this k1000 we got k500 and did put it aside for use at home. We then started a business with k500 and for it we bought 2 goats which we went and sold them, after selling we raised k1000, from that k1000 there are some expenses incurred. Each goat needed k30 to be transported so for 2 goats k60 was used for transportation. Then transport for the person taking the goats we used k60, lunch k100, so the total expenses we found that its k220, then from k1000 we remove k220 and remain with k780 from which we subtract the capital we started with which is k500. So, the profit was found to be k280.
E01 - 1911 yes continue
P22 - 1912 number 2, we came and did piecework of cutting 10 ox carts

of cutting firewood. From there one ox cart was costing k20 of which from the 10 ox carts we raised k200. Form this money we said no let's do a business. The business we did was to buy chickens, from k100 of which each chicken was costing k25. So, we bought 4 chickens from the k100. Then these chickens were taken to be sold of which each chicken costed k50, so we managed to raise k200 form the 4 chickens sold. And the only expense we incurred was lunch because transport we used a bicycle.... aaaah... lunch was k20. Now for us to know the profit we added the k100 that we started the business with and the k20 for expense, it gives us k120, and then we subtracted from k200 and found that the profit is k80

E01 - 1913 okay, are we together?
P00 - 1914 yes
E01 - 1915 you have seen that someone started with produced food and the other one started with a piecework. Now the question is that, these two options, how do they influence these cups, do they add or they reduce? When you look at the cup for cash.... does it add or it reduces?

P22 - 1916 with serious considerations, we have seen that it adds

E01 - 1917 it adds
P22 - 1918 yes
E01 - 1919 are we all agreeing that it adds?
P00 - 1920 yes
E01 - 1921 it adds.... okay...what about on the cup for livestock, does it add or reduce?

P22 - 1922 again, it adds
E01 - 1923 yes
P21 - 1924 what we are noticing here is that they are just selling but nothing is being bought from the profits. We have not heard that they buy, so meaning that on the livestock it is reducing because the money is just going to business

E01 - 1925 okay..... we all have the papers?
P00 - 1926 yes
E01 - 1927 then.... these goats add where... this side on cash, so now am saying the cup for cash has increased. Now what about livestock?

P22 - 1928 it has added because I can buy more goats from the k280. It has added

E01 - 1929 no
P14 - 1930 it has gone down, you bring the recorder here, the cup for livestock has gone down, you don't have any goats that have remained. All of them you have taken them for business

P19 - 1931 from the business that when we come to buy
P14 - 1932 you have money but you don't have goats, right?
P16 - 1933 we are still looking for them
P14 - 1934 yes, you have money but you don't have any goat yet.... let's be together.... like the way I have sold the chicken, where I got it do I still have it or not? I have taken it for business.

P15 - 1935 now that's when we are starting
P16 - 1936 but we have the profit we have realized
P14 - 1937 now there afterwards do you have goats?
P15 - 1938 they will be there
P19 - 1939 there you have money for the chicken you have sold, right?
P14 - 1940 yes
P19 - 1941 what do you want to buy?
P14 - 1942 I will buy something
P19 - 1943 even us this money we want to buy goats
P14 - 1944 but there, it's not showing that there are some goats that have remained, that's why he is asking that, on livestock are goats there?
P16 - 1945 so now
P14 - 1946 the goats have been left out
P22 - 1947 the money that we have, the profit meaning that it will bring goats...

P21 - 1948 use a recorder
P19 - 1949 you start afresh

- P22 - 1950** this money which is left, the profit, these are the goats on livestock, this same profit
- E01 - 1951** okay now are you taking the whole profit to livestock?
- P22 - 1952** yes
- E01 - 1953** so how many are you going to buy?
- P22 - 1954** here
- P16 - 1955** you buy 2, k140 each
- P22 - 1956** we just buy small ones for rearing not those ones like the ones we bought for selling. We will buy small ones so that we buy 2
- E01 - 1957** oooh you buy small ones
- P22 - 1958** yes
- P16 - 1959** k140 each
- E01 - 1960** okay how is it group 2?
- P00 - 1961** laughing
- P22 - 1962** you were behind on profit
- E01 - 1963** have you seen the lesson at hand, to say when you pick a pathway, each pathway you need to take a serious consideration to say how the cups are going to be influenced
- P22 - 1964** yes
- E01 - 1965** otherwise you may just concentrate on cash meanwhile the other cup this side is going where?
- P22 - 1966** it's going down
- E01 - 1967** so, as you are removing others should be doing what?
- P22 - 1968** should be remaining
- E01 - 1969** then.... maybe there is another addition this side on the examples? We have seen that some pathways reduce the cups but they are ok. You only need to be very considerate to say some.... you may find that the whole livestock is what?
- P22 - 1970** finished
- E01 - 1971** yes, maybe there are any comments?
- E02 - 1972** I don't know
- P17 - 1973** yes, you cannot answer on something you can't understand
- E01 - 1974** then what about this side, the other options, the starting point, it's what its piecework right?
- P22 - 1975** yes
- E01 - 1976** you started with piecework and then you said what?
- P00 - 1977** cutting firewood
- E01 - 1978** yes, cutting firewood, then.... now you look at the cups, this other pathway does it add on the cup for cash or what starting from piecework, on the cup for cash, doesn't it add or it doesn't add?
- P16 - 1979** this one who ventured into firewood is the one being asked
- P21 - 1980** on the cup for cash it is adding but on the land, it is reducing
- E01 - 1981** ok, so on cash it is increasing, on land...
- P00 - 1982** it's destroying
- P14 - 1983** the ox carts were too many..... laughing
- E01 - 1984** oho.... the ox carts were too many
- P00 - 1985** yes..... laughing continues
- P21 - 1986** the second option, on cash it's adding, and then on land the water is going down because where 10 ox carts can come from its deforestation, destroying the land
- P00 - 1987** exactly
- E01 - 1988** okay
- P21 - 1989** sure
- E01 - 1990** so, you have seen.... yes, it is also a pathway but in future....
- P14 - 1991** it destroys
- E01 - 1992** yes, it destroys meaning that your children, there life will be worse because what we have done now does not help them in what?
- P00 - 1993** in future
- P22 - 1994** but have you seen that, the point we have brought in is good, we have now learnt..... busts in laughter
- E01 - 1995** so, learning is the most important to say if we do this what about other cups, what's the effect
- P22 - 1996** yes
- E01 - 1997** yes.... okay so what should be done in such situations for us to control the mistake so that land does not do what? so that it is not destroyed?
- P22 - 1998** here what is needed is a law that binds the cutting down of trees
- E01 - 1999** okay the law

P22 - 2000 punishing those that would want to continue destroying
E01 - 2001 ok alright maybe we go to group 2, you have seen the lesson, right?
P16 - 2002 group 2 the landlords
E01 - 2003 what we were doing with group 1 is the same
E02 - 2004 we need to crap for them
E01 - 2005 she is saying that we crap for them for the work they have done..... okay let's go the other group
P14 - 2006 let's go teacher
P22 - 2007 where do you want us to go? Just here, bring the flip chart here.
P16 - 2008 this is where there is a shade...
P21 - 2009 where is my lesson plan...?
P14 - 2010 it was difficult here
E01 - 2011 so here you were looking at....
Group 2 (G02) starts explaining
P21 - 2012 group 2 we were looking at landlord so that in future we don't suffer these problems that we are facing. What can we do that can help us in future or our children to say if we die, what is it that can be helping our children. We thought that if we build a house people can be renting it or using in different ways. To be helping our children to have money for school. Now the stages, so that the house is built, we started with the first step, where can we be getting the money so that this house can be built, we started with the first way that one can build a house. We have looked at the kind of food one would have, he can grow soya beans, maize sunflower, when these crops are all harvested they are put on budget to say how much food I'm going to reserve for household consumption. How much should I leave so that I can be grinding for pigs to be eating? What remains you sell and then the money you keep it to say this money should be used to build a house so that in future it helps

me. We find this person has money now, in having money, you look for a place where you are going to build the house from. is it here in where I'm living now or is it at 4 ways or Chibombo where there are lot of people so that people can quickly admire it and use it. This person has found a plot and after finding the plot, from the money he has found after selling harvested crops he hires a brick layer so that he measures how the house should be. Then from the same money he puts some aside so that he can use it on working, then depending on how he has made the budget whatever money is remaining he buys materials so that the house can be put in place.

From buying this.... there we finish the house. Maybe it is in Kabwe, Chibombo or anywhere where there are a lot of people, there are people who are working but they don't have where to stay so they can admire that house and rent it in. the money comes where? The money comes to fill in the cup for cash at home. Then after this house has filled in the cup because this person is a business man, he is a farmer he again gets the money and uses it to buy inputs because the children are still young to start using the money. Here we are talking about the future, he buys inputs he plants and produces food, we then come back to food which he put in the budget and uses it in different ways. The way he can think of using it, he can get cash and come to feel the cups for livestock when the tenants pays, he then buys inputs. So, this means that if one manages to build a house, the house doesn't get sick neither rotting, tenants just exchange the house meaning

that children can endure hardships like we have seen. Then again, we find another person who doesn't have where to start from, one who hasn't reached at a level where he can produce but not enough to reserve and sell some food, all he can do is produce and leave the food for consumption. Sometimes it is even difficulty to produce enough food for consumption, so here is a wife, they say don't just sit the chickens are cheap now, that one your grandfather gave you, it produced come and get 2 cocks and sell at k50 each. Go and join OSAWA, he gets his cocks and sell he raises a k100, he goes to OSAWA. What OSAWA does is that they give you money that is bigger than the amount you saved, what is important is that you need to use the money that you get so then you can be able to pay back with the interest required, if in this group he raised the money through selling chickens, after selling these chickens, he managed to buy 1 bag of seed because he is a person who doesn't have money. So that seed he plants in the CF basins where he had put cow dung, when the rains come the maize grows. Well the he produces and raises a k400, he pays for FISP and they give him 4 * 50 kg bags of fertilizer, he then cultivates and he reaches at a level of producing enough food for consumption and be able to sell some. When he reaches at that level, it means that he also in the position to build a house that will be giving him money so that children can use in future. This is where we have ended.

E01 - 2013 okay anyone with what to say?... Now can you manage to, is it within the same year..... the money that will be realized from food can you manage to

build within one year of producing?

P00 - 2014

E01 - 2015

no
it can take years.... if it is years what is needed because in the years there are uncertainties that befall us. You just find that on the foundation you are stack. What is that which is needed because this side you said it takes years

P21 - 2016

E01 - 2017

yes
meaning you continue with the same process until the money becomes a lot such that if it is a house each year it is improving.....

P21 - 2018

What is needed much is a proper budget, the house is in the program, when you find money you need to put it in proper budgeting, the other money you use on the other side so that you manage to produce food, the other money at home

E01 - 2019

P19 - 2020

ok maybe there is someone with an addition?

my addition.....my addition is that days are not the same, you may manage to source money to start with, and then the following year you may fail to source any money to build a house. So, at that time, the days of dying catches up with you.....laughing

P16 - 2021

P19 - 2022

but here he started with farming

yes, but farming doesn't mean you will be doing well every year till the house finishes no

P16 - 2023

P15 - 2024

yes, then you run to business, so that you it can move

but still here you are not preparing for yourself but your children

P19 - 2025

P14 - 2026

yes, but the children would not have reached at the stage of building a house

if time to dies catches with you, it's to die... busts into laughter

P00 - 2027

E01 - 2028

laughing

yes, you can repeat that, what are you saying?

- P21 - 2029** we are talking about food, these crops we produce we don't just produce maize, in case there is a drought such that all the crops die, as a farmer we plant different crops like soya beans a hectare of cotton, a hectare of sunflower not just maize, then in the same if you have not produced well, if its maize the house can be on standby and you concentrate on the side where you have failed you say let me first produce food so that I continue building that house.
- E01 - 2030** ok I think one important thing he has explained here is that, every year you are revolving at the same point, and then little by little you are what?
- P22 - 2031** stage by stage
- E01 - 2032** yes
- P22 - 2033** depending on the money you have
- E01 - 2034** yes, but your goal
- P22 - 2035** it should finish
- P21 - 2036** the house should finish
- E01 - 2037** yes.... others will be found dead...
- P14 - 2038** there are others who die and leave the children at a tender age
- E01 - 2039** now so that you can manage, what is the most important thing to do here?... yes, because maybe it will take 7 years for the house to finish. What is it that you really need to do?
- P14 - 2040** you cannot know.
- P21 - 2041** what is important is to work hard to finish the house
- P19 - 2042** it's to build something you can manage not a very big house that you fail to finish it.
- E01 - 2043** yes, now what should you do so that you become a landlord?
- P00 - 2044** laughing and talking to each other
- P22 - 2045** what is needed here, we are different in levels, don't start a very big house, you first start with a small one so that maybe it is 2 rooms then that's when you can start a big one
- E01 - 2046** ok alright.... so what else mothers are you saying you can manage to be landlords it the husband is getting and taking....
- P14 - 2047** for beer drinking
- E01 - 2048** then you also, you buy chitenge materials while the plan is there, you start being wasteful, are you saying you can succeed?
- P00 - 2049** no
- E01 - 2050** so, what's needed here?
- P16 - 2051** not being wasteful
- P21 - 2052** what is needed is doing what is right
- P20 - 2053** thank you, what is needed is working together as a couple in the house
- E01 - 2054** okay working together, cooperation.... but.... now for you to start working together what should you do?
- P16 - 2055** there is a question here, on where we talked about cooperation between couples. Now what about us who are not married.... should we also just be disciplined?
- P00 - 2056** even alone you need to be disciplined
- E01 - 2057** maybe let's start with the same question to say, you who are married, how can you work together, in what ways?
- P22 - 2058** on that one
- E01 - 2059** because.....
- P22 - 2060** working together you can manage to work together but we talked about maybe there is carelessness so for you to work well you need to remove what?
- P00 - 2061** carelessness
- P16 - 2062** how do we remove carelessness?
- E01 - 2063** yes, how do we remove carelessness, you find that each one is doing it secretly
- P16 - 2064** yes, how do we remove carelessness?
- E01 - 2065** yes
- P14 - 2066** yes, **P16** and **P15** how do we remove carelessness.... get the recorder, mine is not started yet
- P15 - 2067** You just get the recorder and explain what you think, why is it

not finishing, are you not working together?

P14 - 2068 you explain we here

P15 - 2069 the reason we have not finished the house yet is because of carelessness because they don't give us enough money, so let me also get a tin and sell.

P17 - 2070 then how do you remove carelessness?

P15 - 2071 how to remove carelessness, all we need is togetherness and agreements

E01 - 2072 okay, in discussions not in budgeting

P15 - 2073 in all things

P14 - 2074 if we want to build a house with my husband

E01 - 2075 yes

P14 - 2076 we sit and discuss on the design of the house, the amount of money and other expenses. So now my dear let's be careful in the way we use cooking oil, eating well we can reduce

E01 - 2077 okay

P14 - 2078 so that we manage to build, so, me as a wife, I will be able to understand because he has put things clear, the way the money should be used. Now we come to the wives, I'm going this side, am going to buy cement but this money is little, the wives comes in and say I also want to go, how do you go when the money is little. The money you are going to use for transport can be used to buy a bag of cement. So, carelessness starts. Friends building needs cooperation in thoughts and actions so that you become a landlord, you need to be united people of God.

P22 - 2079 discipline is important

E01 - 2080 oooh discipline is needed

P22 - 2081 yes, when handling money

E01 - 2082 ok discipline.... ok, have we heard how she has explained?

P00 - 2083 yes

E01 - 2084 she said togetherness in both thoughts, in actions and bring things on the table so that even your partner can know how you

are giving. So that he prepares to say this kapenta you want to give someone, don't give them the whole gallon, but just a little because we are also going through tough times because we are building that side. But if you are not disciplined at the time you find some money you use you will have a plan but nothing can do what?

P00 - 2085 that can happen

E01 - 2086 yes, then I wanted to ask about SILK, how do you call it, SILKU is it there?

P21 - 2087 OSAWA yes, it's there

E01 - 2088 why is it called OSAWA?

P17 - 2089 yes OSAWA

E01 - 2090 ok OSAWA what do they do, when did they start?

P17 - 2091 it first started in 2010

E01 - 2092 ok it started in 2010

P17 - 2093 yes, is started in 2010

E01 - 2094 so, what do they do?

P17 - 2095 we save money

E01 - 2096 okay you save money....so from the time we started no one told me that you save money, so maybe even that saving is important even when it is only a little.... yes, you can continue

P17 - 2097 Yes, we save, like we are sited here, it can be one group, then a member contributes maybe it is k50. Then this money they add together, maybe it adds to k1000, so whoever wants to get on credit, in same k1000, you get and every month k100 at the interest rate of k25

E01 - 2098 okay

P17 - 2099 yes k25, per month k25

E01 - 2100 okay

P17 - 2101 yes, then every month we meet to save, again every month there are people who get on credit and do business. That's how business started.

P15 - 2102 what about the end of the year?

P17 - 2103 at the end of the year, it depends on how much money each member has managed to save then you share the money.

E01 - 2104 okay

P17 - 2105 in October we share it, now it depends on how much each one saved with his/her interest
E01 - 2106 okay
P17 - 2107 yes
P15 - 2108 then they go and buy inputs
E01 - 2109 ok, then that side you go and buy inputs
P15 - 2110 yes
P14 - 2111 yes, then you come on land
E01 - 2112 okay then eeeh..... as we are coming to the end of the lesson, I'm sure you have seen that the purpose of the lesson, there are three parts, there is an aspect of environment, a part for.....
P19 - 2113 government
E01 - 2114 the area for the government and the part for social economic life. Then all these aspects centres on these whether hard or easy, it is centred on these aspects. Then we looked that in future things will be hard, now we have come or help each other by sharing ideas so that we prepare for the time yet to come. Then from there we looked at the ways to say what ways can we put in place so that in future we'll be ok or maybe for our children to be okay. From there we looked at these options to say these options are different, some do fill the cups and other cups are reduced. Then we said we should check the options you have chosen or ways you have chosen so that the cups should not be going down because our idea is to go up or improve so that even if we come after 2, 3 or 4 years and ask to say where have the cup reached, you should say at least for us its better. If is the house, you say its maybe on window level. Okay that's it. So, for us that was the idea because when we came last time, it was just a short-term planning but now we are looking at the future or the years to come.

E02 - 2115 *said something though not clear*
E01 - 2116 yah
E02 - 2117 laughed
E01 - 2118 she has reminded me that the group two we didn't do what.....
P15 - 2119 yes, you didn't clap for us
P00 - 2120 laughed while clapping
E01 - 2121 yah, thank you very much, now we want to give you a home work because us we have done our work and we have thought, it's up to you the way you have seen to say if life is becoming easy or maybe the FISP is okay, cash becoming more or its opposite. Now the question we have is that from here what options do you think to do and by us asking like that we don't mean you should tell us to say nor for us the way we have learnt so we think of doing this and that no. if you think of not doing anything its fine with us we will not feel bad. Just tell us that we don't think of doing anything. It doesn't mean we will not come back, but we may come back and ask you to say why did you say that you don't think of anything to do after you learnt? And also looking at the options, you can use because if you wait for the government to improve your lives it will take time because now they have introduced the voucher system and maybe they will.....
P00 - 2122 they will finish
E01 - 2123 and then the children will need to go to school, meaning we should improve our lives ourselves. So, in short what we are asking is that what is the way forward for you who have learnt from the time we started? What do you think? Have we heard the question? So, if you want to answer you can answer and if there is nothing which you are thinking of just tell us to say we are thinking of nothing.....
 yes, you can tell us to say yes

we have learnt but there is nothing we are thinking of.

P20 - 2124 thank you for all the lessons you have taught us

E01 - 2125 okay

P20 - 2126 I think it can help to improve our lives, now our wish is that you should continue visiting us don't go for good so that you keep on reminding us where we are lacking behind, thank you

E01 - 2127 okay, now you what..... because you said we should continue visiting you, now we continue visiting but now you, what do you want to do and that's where there is a question to say its 2 years, even last year we were here right?

P00 - 2128 yes

E01 - 2129 yes, now what do you want to do and that's why we were asking to say what challenges did you face from the time we learnt last time for those who tried what we learnt, and you said it's this one and the challenges. Now we are asking you to say what are you planning of doing or what is the way forward?

P21 - 2130 for me seeing that some challenges on what is happening now and also in the future and I have seen that growing maize is becoming a challenge, even cotton also needs a lot of rains and now what am planning to do, I chose to have a garden, even though I have a garden I saw that water from the well is becoming problem when we reach somewhere in September and at times it finishes. So, I'm planning to say I need to prepare even if there are challenges so that the children do not suffer. If God helps I'm planning of having a borehole so that I can be watering the plants of which I will have more cash for building, buying cattle and also using other things. I think that's the plan I have.

E01 - 2131 okay you have heard his plans, according to what we have learnt, he is thinking of having a borehole so that he can be doing gardening. Then from gardening that's where he can make these other cups to be full.

P21 - 2132 to be full

E01 - 2133 yes

P15 - 2134 let everyone do whatever he/she thinks

E01 - 2135 let's everyone do whatever he/she thinks?

P15 - 2136 yes

E01 - 2137 okay then now like for you on the plan for the borehole, you said you want to have a borehole, now what options are you going to use so that whenever you want to move away from the plans, you go back to say no here even if this has happened and maybe you want to use the money for borehole, then you will say no this is for the borehole. What will help you stick to your plans? opening an account for the borehole

P21 - 2138

E01 - 2139 to open an account, okay are we together because here we are just teaching each other, sometimes your friend maybe talking now but in future, you start saying that, that one is living a good life, forgetting that it's from this same planning. Yes, now as a group is there any plans which you have in which you can use this knowledge you have learnt from these lessons..... Yes, **P16**

P16 - 2140 I think that question like in a group, what can help us is just to use or maybe save something as a group and I think that can be an idea also, so that we have cash and as a group we agree to say let's do this. Number 2 even a business we say okay let's do this or maybe let's contribute such amounts and we start this and it's for the group.

E01 - 2141 maybe there is someone with any additions.....yes

P22 - 2142 what I want to say is that thank you for the knowledge you have given us, there are a lot of things we have learnt, now in most cases, like the way you have taught us, others may have ideas ringing in their minds but it's just hard to let them out. So, you should give us a chance to say if you will visit us you will be able to see to say, these people this is what they have done.

E01 - 2143 okay we give you time?

P22 - 2144 yes, a homework

E01 - 2145 we leave you now and when we come back you will tell us?

P22 - 2146 yes

E01 - 2147 now just there you talked of planning, even us we want to plan to say, when do we visit these people, then we look at what people want to do. If it's not us, even these same guys our assistants we can send them to say this list of people, if you give us maybe a week or 2 days, we will send them to say go and record their plans so that we help each other, we make a road map to say, do you remember there was this plan, how far have you gone? So, you will tell us the amount of time you want us to give you. If its plans, they can have them written down so that we can know to say here are the plans.

P19 - 2148 here the time we are going to give you because our crops are still in fields, so we will give you up to September

E01 - 2149 okay

P19 - 2150 me that's my suggestion

E01 - 2151 giving us your plans

P16 - 2152 give them plans so that if they come they should find.....

P19 - 2153 that's what we are going to do

E01 - 2154 no

P24 - 2155 before you harvest, what you are planning to do

P15 - 2156 yes, when you harvest

P24 - 2157 like this we will fail

E01 - 2158 yes

P16 - 2159 to say the plans that you have since you have cultivated.... my plan is this.

P17 - 2160 yes, what you are planning to do

P19 - 2161 if that's the case then time will be short, uncle you tell these people

The audience busts in laughter

E01 - 2162 because for us our job has done what?

P16 - 2163 has finished

E01 - 2164 if there is any more job to be done, it's to look at what and how the plans of these people then I was thinking that each one should register if it's with **E03** or with you maybe..... laughing

E01 - 2166 okay we will ask **E03** and friends to get a flip chart and write

P22 - 2167 yes

E01 - 2168 yes, **P21** has already mentioned what he really wants or maybe even if maybe it will take him 3 years we know that how far have you gone, he says maybe now we have reached a level where a borehole can be sank, maybe this time how far at the bank the money is enough to sink a borehole so that the people who are monitoring me should know that I have succeeded

P17 - 2169 even when you want to build a house

E01 - 2170 yes, even if you want to build a house, whatever you want to do, what you want to do, if it is putting iron sheets, just like that..... so, after a long debate, the suggestion should be recorded individually.....I think maybe we can finish

P17 - 2171 we pray...

P14 - 2172 he still wants to go and make plans

E01 - 2173 so..... so aah what we were thinking ourselves is like this, like you have said that you will choose each one his or her project, what one wants to say where I am now is here. So, us

what we have been thinking about is that we will try to make some books, something like a table, something like paper, a book so that we give each and every one can..... you write to say now I am at this stage, so that when we come we will just ask to say where have you reached? When we look at the... or maybe you tell us to sell on this one I succeeded or maybe on these things it did not go well or here its better, so that we help each other from that point. So that was our request or our thinking, it's up to you, let's be free, do you remember the first rule when we started the lesson? It seems this madam (P18) it's to be free, right?

P19 - 2174 yes

E01 - 2175 yes, so let's be free, I have explained our idea, and it can help us, so I don't know what you think, are we together?

P0W - 2176 yes

P17 - 2177 have you heard?

P18 - 2178 no

P15 - 2179 he is saying that, if we are agreeing they can give us books so that we can be recording

E01 - 2180 yes, just like what you do when you go for under five clinics to say now the child how is he growing just like that and we are asking to say how is it?

P21 - 2181 it's just okay

E01 - 2182 okay

P22 - 2183 it's a good idea

P15 - 2184 yes, because you will be doing it your own

E01 - 2185 okay we will bring, then you can.... because that one is not just a suggestion, so even you, you can discuss if you want to do it as a group it's fine. So, as we have gone to the end I think these people from the kitchen are waiting for us, as we reach the end maybe you have something to say?

E02 - 2186 that's much more I'm impressed by the energy here

and I hope this will continue to go further that will be interesting to get the feedback.

E01 - 2187 okay for her, the words she has is that she is very much happy with your willingness from the time we started to now and also looking at it to say, she really wants to have what you want to do and how are things going to be progressing. Now we want to thank you for the time, we know you were supposed to do your own work which can make the cups full but since morning the time we came, you were honest up to this time, we have talked, we have taught each other's. So, on that part we thank you so much and may God bless you in all what you want to do. So maybe the owner of the place can say something then after that a closing prayer of which after praying I think there is food prepared that side. And they will tell us what to do, yes, the owner of the place/ household.

P22 - 2188 what can I do?

E01 - 2189 no maybe you have something to say before we pray

P22 - 2190 are we together?

E01 - 2191 yes

P22 - 2192 this one will pray for us

P00 - 2193 discussing in the background

Appendix 4. Follow-up transcripts groups A and B

FEEDBACK GROUP A – October 2016

E01 - 1 we all go to church here, so let a volunteer pray for us as we start the discussion.

P08 - 2 Mr. **P10** you can pray for us.

P10 - 3 Praying

E01 - 4 thank you so much. Without wasting much of the time we start. We have come again with three major discussing points for today. Our discussion won't take long maybe just an hour. We just want to remind each other on what we have been discussing and also to see the way forward. So, the first discussing point is that "what benefits and challenges did you find in the workshops and the exercise of recording believing that you all have books".

P00 - 5 yes, we do have the books

E01 - 6 what benefits did you find and also what challenges did you find? After you have answered I will also explain what we concluded after analysing the data we got. We collected data from 10 families who are not under this program within this village so that we see if there is a difference between you who learnt and those who never learnt in the way you do things. But before I do that I want you to tell us the benefits and challenges you found in the past workshops. After that we will go to the second part. Thirdly we will talk about the way forward. Without wasting much time let's start discussing. What benefits did you find and also what challenges did you encounter in the learning process? If you were not recording just tell us to say I never used to do that because of this and that. You can start there.....

P01 - 7 where do we start from? Give **P08** to start as I am still thinking.

E01 - 8

P08 - 9

oh okay

we had plans of achieving some things as we promised you but the challenge we faced was finances. We get our finances after selling our produce but this past season our crops were affected by drought hence low production. Coming to the book, I personally saw the book as a summary of our life's aspects. It's beneficial in such a way that if you forget something you just go and check in the book. Since we record every month we are encouraged to work hard every month so that we continue improving. We are struggling so much due to insufficient rainfall we are receiving for the past two farming seasons.

E01 - 10

P09 - 11

someone else to add.

I will start with benefits we found. We acquired knowledge on how to do record keeping. Record keeping enables us to trace how you use the money and also know how the progress is either positive or negative. This program also exposed us that we were careless because we never used to audit ourselves. The workshops helped in that we still have the assignments of feeling in the cups. Coming to the challenges, the first challenge is resource management especially money. As farmers, we don't get money as a lump sum no. whatever money we find we use it and record though its difficulty to take account of very small amounts spent. Keeping accurate record on food is so problematic. For example, you go somewhere and you eat something when you reach home you won't think of recording that money you spent. And the prices of things are fluctuating due to Zambian unstable economy.

- Record keeping on food was a problem but not on livestock, land management, water and others. The other reason why it was difficult for us to record is that other foods we buy and others we don't so we were not able to estimate how much those food stuffs we don't buy can cost. The small things we buy are difficult to assemble together. We used to overlook small things but when you buy a bigger thing that's when we could record. All in all, being accurate in recording day to day food consumption was a problem. That's what I can say.
- E01 - 12** what of women, what are you saying?
- P01 - 13** thank you, our heads were opened due to the knowledge you gave us. Starting from the cups we realized that we needed not to be wasteful of anything. We realized that we need to be careful on how we use the available resources. Coming to the books, they are so helpful to us. For example, before you gave us books, when some livestock die we never used to keep record of how many we have lost but now since we record we are able to trace everything that is happening around us. By so doing we are able to assess if we are progressing or not.
- E01 - 14** another one to add?
- P05 - 15** before me being given that book I never used to do record keeping but from the time I started recording I even know where am heading to. That's the benefit I found.
- E05 - 16** yes, someone to add.
- P03 - 17** I will also talk about the goodness of books. At the end of each month we are reminded of recording all the activities that took place in that particular month. It helps us to be working hard every month so that we can be finding what to record. That's the goodness I found from the books.
- E03 - 18** what of the challenges you faced?
- P03 - 19** do I have to talk about that too?
- E03 - 20** yes, you need to tell us the challenges you faced too.
- P03 - 21** okay let me think through on challenges.
- E05 - 22** give your neighbour the recorder.
- P06 - 23** am still thinking though but just bring it. About the books I only saw benefits. As others have already alluded to, most times we never used to know if we are being wasteful or not because of not record keeping. We just used to do things anyhow. For us to realize that we are not progressing we could have already misused all the resources and we can't reverse that so that you start afresh. We now know how to use the available resources more efficiently. We also know how to serve on the aspect of the available food because we stopped being carelessness. I failed to make the cups full due to lack of enough resources but am trying my best to do so. Thank you.
- E05 - 24** which cup amongst them all is being problematic to feel up?
- P06 - 25** the cup for cash. This is the main body for all the activities we do and other cups are also attached to it. Even when you want to cultivate you look at the cash available and other things like inputs, hiring labour etc. All these are dependent on the cash cup.
- E05 - 26** anyone with anything to say?
- P08 - 27** **P10** has not said anything yet
- P10 - 28** my wife has already spoken
- E05 - 29** no that was her experience but now it's your turn to tell us your views.
- P10 - 30** as others have already said the biggest challenge was rainfall. Here we have taken farming as a business. Due to insufficient rainfall, we never produced enough as we

expected hence less money we got from the sale of crops. We sale the surplus after removing some for consumption but now we just produced little and it all went for consumption. Meaning we are handicapped in doing other activities. For other activities to take place, money is requiring so we are forced to get some from the consumption maize to sale so as to do other activities. These other cups to be full they are dependent on the produced food. If we produce well, we sell the surplus and get money which we budget for various things. I think on the cups that was the only problem. Coming to record keeping, we saw it to be a good exercise because we are normally not active after harvesting until the onset of rainfall but now we are kept busy with it. Record keeping is good because it makes us plan properly in areas we are not doing well. The categories of things in the book help us to know the things we have and that we don't have. It encourages us to keep on working hard so that we improve our livelihood standards. You can't just be recording zeros from January to December no but you need to replace the zeros with real numbers. Record keeping is good than just mastering things in your head for we are bound to forgetting as human being but if you recorded you can just check in the book. As for me I never faced any challenges and if I say the challenge I faced is not buying a cow then that means I just didn't buy it. Record keeping also makes you know the level you are at. Let me end here.

E01 - 31
P08 - 32

okay
that's why we used to be hunger stricken because in married we used to do whatever pleases you with

the reserved maize for consumption. When the husband is no around the wife will sell some maize and when the man comes back he will be like let me say too because my wife sold too hence finishing the reserved food. But these days we do things together as husband and wife. By so doing we will take account of resources properly especially on food security.

E01 - 33
P09 - 34

okay
the other benefit I can add on is that this knowledge you brought made us start thinking outside the box. We have now explored many other ways of sourcing funds besides farming. It has given us knowledge on how to improve our livelihoods. We are no longer limited in thinking. And we are able to assess ourselves on what projects we can do better. Before learning we never used to do all that.

E01 - 35

the other question is, what examples can you give of things you managed to do and also those you didn't manage to do, because if you remember you gave us goals to be achieved by the end of this year? You might have failed to achieve some goals but maybe there is something you are doing though not yet done all that is an achievement. If its seed, you tell us that I already bought seed. What did we manage to do because of this program and also what didn't we manage to do? Have you understood the question?

P00 - 36
E05 - 37

yes
anyone can start because each one of you will say something.

P06 - 38
E05 - 39

am still thinking
continue thinking as he speaks

P10 - 40

let me talk before my wife because she might mention my points.

P00 - 41

laughing

- P10 - 42** according to my records may, June and July are the months I had good money. So, I thought to myself to say since I had just grown maize last season..... This program is so good and it's not that a person is only faced with problems in one month no. I thought of buying okra seed so that I can be selling from December to May. Last time we were asked to say what crops did you grow last season and most of us were just mentioning maize only and I thought I should plant okra too. Okra is not affected very much with droughts. I want to be taking okra to nearby towns maybe twice a week. That's my way forward from the time we learnt.
- E01 - 43** okay
- P09 - 44** what was the question?
- P08 - 45** as for me what I managed to do is rearing chicken. In the past, I never used to have chickens and when I have a visitor I always used to buy so that I kill for the visitor. I also managed to buy 4*50 kg bags of fertilizer for this coming farming season. I bought groundnuts too.
- E01 - 46** groundnuts for consumption or for planting?
- P08 - 47** for planting, so am just waiting for the rains to come I plant.
- E01 - 48** there are not for your wife?
- P08 - 49** no, she has her own too
- E01 - 50** okay
- P09 - 51** what I managed to do due to the knowledge you gave us; the biggest of all is that I now know how to do budgeting properly. When talking about budgeting I am strict and I only buy what is most needed at that particular time. On livestock, there is an improvement. Since I know how to budget I make sure that when I have money even when it's little I manage to touch all the aspects of my livelihood. I have improved also on food security such that we have food all year round. What I didn't manage to do is..... last season I had bought enough inputs but we were faced with droughts which made me produce less than my targeted goal. Though that was the case I am food secure. What is just dragging me behind is bad rainfall pattern we are experiencing but all in all with this knowledge I am destined for greater heights.
- E01 - 52** what of you Madam **P07**?
- P07 - 53** what I didn't manage to do is to produce reaching my target due to insufficient rainfall but I managed to buy maize seed and also, I bought guinea fowls.
- E01 - 54** what of you?
- P05 - 55** through the knowledge we got I budget well, bought some chickens and we are no longer careless as we used to be. We have now realized that things are hard and so we need to take care of available resources properly.
- P06 - 56** what did you buy **P05**?
- P05 - 57** I bought chickens with intentions of buying goats when I have money.
- E01 - 58** okay
- P06 - 59** as for me I had big plans but things didn't work out the way I wanted them to hence I ended up doing what I never planned for. I managed to buy 10 kg seed plus 6 gallons of groundnuts seed. I also managed to hire labour in advance to cultivate for me when rains come.
- E01 - 60** **P03** you have not said anything?
- P03 - 61** I bought groundnut seed, chickens and guinea fowls. These are the only goals I managed to achieve due to little cash I had.
- P08 - 62** you even had a garden, weren't we buying vegetables from your garden?
- E01 - 63** oh
- P03 - 64** I had made a vegetable garden too and I raised some good cash.
- E01 - 65** meaning the cup for cash increased?

- P03 - 66** yes, though the money was being used up there and then.
- P06 - 67** I had forgotten to mention also that I had a garden too. Money for buying soap, mealie meal grinding and other expenses was not a problem. I was just cut short by animals which ate my vegetables.
- E01 - 68** oh okay
- P10 - 69** my wife has actually forgotten something which I thought she will mention but let me just say it. Gardening helped us so much considering those months when money is hard to find. With the little money, she was getting from the garden she managed to take care of the family without me removing any money. Did you ask us to mention even those we failed to do?
- E01 - 70** yes
- P10 - 71** I failed to take any money to the bank. I thought you only take large sums of money to the bank but I just realized that you can take any amount. Even a k 20 you can take because when starting you start little by little. The problem with keeping the money in the house is that we tend to spend anyhow. But it's safer when we keep our moneys in the banks. What am going to do now is that I will open a bank account so that I can be putting my money there than in the house. I didn't really fail to take money to the bank but it's just that I never had the knowledge on how to go about it. There is also mtn mobile banking so I need to open one as that's the only way to safe guard my money.
- E01 - 72** give the recorder to Madam
- P07 - 73** Yes, I have. As for me am not educated I was just helped to record in just one month.
- E01 - 74** oh, but why weren't you helped to record in these other months?
- P07 - 75** most of the times I was not home and that I can't manage to write unless I am helped.
- E01 - 76** what did you manage to do or what goal did you achieve?
- P07 - 77** I produced maize and sold surplus to raise money for buying seed which I did and I kept the remaining money in the house.
- E01 - 78** how many kilograms of seed did you buy?
- P07 - 79** I bought it from the farms at k300.
- E01 - 80** how many 20 liter tins?
- P07 - 81** 1*20 liter tin at k200 plus 2*5 liter gallon at k100
- E01 - 82** okay
- P06 - 83** its 1 tin and 2 gallons.
- E01 - 84** what of fertilizer?
- P07 - 85** I have not yet bought fertilizer.
- E01 - 86** what of groundnuts?
- P07 - 87** I only sold 2*50 kg bag and the money was used during sicknesses
- E01 - 88** alright. We now come to the second part where I need to tell you our observations after comparing you with those who never learnt. The last survey you saw these research assistants here; they were not just interviewing you alone no we told them to interview ten families of farmers around here who are not under this program too. The reason was for us to compare how they do things and how you do things also. It was noted that there is a big difference between them and those of you who used to record in nearly every month in terms of planning. We discovered that there are three groups amongst yourselves, the first one is for those of you who used to record nearly in all the months, the second one is for those of you who recorded half plus of the months and

the last one is for those of you who never used to record such that the book is almost empty in most of the months. It was also observed that some of you consult each other when recording. Those who are not part of this program do not write their plans anywhere which you do. They were like we know how we do things all the time hence no need of writing but what they forget is that as human beings we are bound to forgetting. They were also like when we find money that's when we will think of what to do with it but as for you, you plan first and later when you find money you use it on the planned things. Planning and budgeting you are really doing well compared to those who are not part of this program. They were happy to notice this difference just after short time of teaching you. But when we come to group three were some of you belong, there is no much difference in the way you do things with those who are not part of this program because you never used to record every month. If you don't record this month you can't assess your progress hence just being like those who were not taught. But to those of you who record every month you are so different from those who are not part of this program in the way you do things because you assess yourselves. Less I forget have you already received inputs from FISP?

P00 - 89

E01 - 90

no, we haven't.
but if you ask those who are not part of this program, they will tell you that I kept money to pay for inputs from FISP instead of just buying in advance. That's why we asked you about what you have done so that we see if you already bought inputs. So already there is a difference because for you don't depend

100% on FISP for inputs. We need to start developing ourselves through hard work little by little. I know things are hard but don't just sit doing nothing but work harder as well. You should always think of those loops to say if this loop reduces which ones can I use to increase these cups. So those are some of the things we found out.

E02 was supposed to come but she failed so I requested to say we need to go tell the farmers that we are not continuing with the program because we have run out of funds. I was told to come which we have done. She didn't tell me but I know to say maybe it's because the Norwegian embassy was closed in Zambia. Normally their projects are taken to countries where their embassies are. I think this also contributed to us not being given funds. But she said that no matter how small the knowledge we gave the farmers let them put it to proper use and by so doing they will prosper. She also said we don't know maybe something might come up then we might come back but all in all thank the farmers for me for allowing me to work with them.

We normally come here with either food or soap but today we said no we should just give them something different because things are hard. It's not allowed by the law to give you money no but we looked at the coming farming season. We said maybe there is a person who wants to buy seed but s/he has a shortage then this can help a lot. This money is to be added on the one you have for inputs. You will be given each a hundred kwacha. Don't take the money for beer drinking please because beer just reduces the cup. So that's the reason I will give to **E02** as to

why this time I am giving you money. So, you will sign against your name and then the treasurer will do his job.
P00 - 91 thank **E02** on our behalf too.

FEEDBACK GROUP B – October 2016

Informal conversation before the meeting

E01 - 92 how was your production this year Mr. **P22**?
P22 - 93 it was not good even if we managed to produce enough for food and sell some. It's just by the grace of God because we never thought we would produce that much. After selling I talked to the area counsellor to buy my maize which he did and after that I bought inputs in advance. I never sold to Food Reserve Agency (FRA) because of transport costs.
E01 - 94 oh, that's good
P22 - 95 and the seed for maize is expensive this season.
E01 - 96 oh
E03 - 97 and how much is a 5 liters gallon of maize now?
P22 - 98 its k8.50 if not k9
E03 - 99 okay
P22 - 100 but somewhere near 4 ways they are buying a 50kg bag at k115
E01 - 101 meaning hear a 50kg bag is at k102
P22 - 102 but a 50kg bag is being bought at k108 here.
E01 - 103 oh k108
P22 - 104 yes
E03 - 105 the maize will reach k130 per 50kg bag
P22 - 106 yes, because that k115 per 50 kg bag am talking about was in September not knowing about now.
E01 - 107 okay
P22 - 108 in July, it was k120 per 50 kg bag but during the election period the price went down
E01 - 109 okay
P22 - 110 but at least the prices are now rising
E03 - 111 it's okay let the price of maize just increase because the inputs are also expensive this year.

P22 - 112 inputs are expensive yes because a k25seedco seed was at k550 but now it's at k700 plus. This was new variety last year and it seems to be good though it didn't yield well because of droughts. Also, zam seed was at k400 plus and now it's at k600 plus. Last season the cheapest was a 10kg bag of seedco 403 which was going at k150 though now its k180.
E01 - 113 oh
P22 - 114 and it seems rains are coming very soon maybe before October ends.
E01 - 115 yes
P22 - 116 your mother **E03** built a house but when are you bringing the iron sheets so that she can put a roof?
E03 - 117 I will soon. That's the project she promised to do during the workshop.
P22 - 118 yes. I also want to drill a borehole because I want to start doing gardening like **P21** is doing. There is also another man near Chibombo turn off who is also in gardening and he is really doing well. At the moment, he has tomatoes and maybe in few months' time he will plant maize.
E01 - 119 what is needed is just proper planning.
P22 - 120 yes, and water should also be available not always relying on rainfall.
E01 - 121 yes
P22 - 122 if I have a borehole maybe thing might be less tough
E03 - 123 when things are hard that's when people start planning
P22 - 124 yes, because in the past I was thinking of buying a car but now since water is a problem I just have to drill a borehole.
E01 - 125 okay
P22 - 126 but I don't understand why people are late for the meeting. They were all communicated to say by 9:00 hours we are supposed to be here. When you called them, what were they saying?

- E03 - 127** that they are on their way coming
- P17 - 128** three are here so we are just remaining with three from this side.
- E01 - 129** yes
- P22 - 130** are you already done with group one?
- E01 - 131** not yet, we thought of starting with you here because group one is where we pass when to going to Lusaka. So, from there we will just proceed back to Lusaka.
- P22 - 132** okay
- E01 - 133** how much are goats in Kasumbalesa boarder post?
- P17 - 134** the prices have gone down but a big goat is at k350. The prices are go high if no one brings from kalomo because them they have bigger breeds.
- E01 - 135** what of sheep do they buy too?
- P17 - 136** yes
- E01 - 137** which one is more profitable between goats or sheep?
- P17 - 138** sheep
- E01 - 139** okay
- P22 - 140** this is when you are coming?
- P14 - 141** yes, am not feeling well if they had not come to pick me up I wasn't going to be here. I just saw the vehicle and I knew.
- E01 - 142** these three who are remaining maybe they are bathing now. But I think we can start and if they don't come we will take back the incentives.
- P00 - 143** *greeting each other*
- The meeting starts**
- E01 - 144** I think we start the meeting and these who are still coming will find us along the way.
- P00 - 145** yes
- E01 - 146** someone to open in prayer for us
- P17 - 147** praying
- E01 - 148** move closer Mr. **P20**
- P22 - 149** so that we are together
- E01 - 150** we have come again.....
- P22 - 151** yes
- E01 - 152** what we are here for is to hear, (1) how these workshops helped you, the challenges you faced and also your achievements. (2) Letting you know about the way forward after this meeting from our side. **E02** was supposed to come last month but she didn't as you all know. So, I will explain on that point. So, we will first hear the challenges you faced in using the books we brought and also their benefits. So, who will be the first one?
- P17 - 153** let me be the first one. The book helps me a lot in that it makes me know how to do my business and also how to manage, buy and sell my livestock.
- E01 - 154** what challenges did you face?
- P17 - 155** let me think through first
- E01 - 156** let someone take it up as she is still thinking.
- P22 - 157** the benefit we found is that the book made us know how to audit the money we spend. Also on budgeting it really helped us a lot such that now we are able to budget no matter how little the money we might have.
- E01 - 158** okay and what of the challenges?
- P22 - 159** though it was beneficial the only challenge I had was forgetting to record in some months
- E01 - 160** but what used to make you forget to do so?
- P22 - 161** just being busy
- P14 - 162** I think it's because this thing of recording is new and that we are not yet fully used to it.
- E01 - 163** okay, another one?
- P22 - 164** on the part of relish, it was difficult to record but these others there was no problem. That's the part we used to forget recording.
- E01 - 165** a different person to also tell us the benefits and challenges in the recording exercise.
- P20 - 166** it acts as a reminder to us on what we are to do. We also think to say, what must I do to improve on the part of food, livestock, and other aspects. It's a reminder to me. The

- challenge is that some of us we used to just record same things every month due to us not having a diverse of livestock. It used to make me lazy recording maybe one chicken always every month but to those who have a lot of livestock it really encourages to record.
- E01 - 167** okay, someone to add something. It seems no one but what if we say the program has come to an end can you continue using the knowledge we brought plus recording in the books?
- P14 - 168** yes, we can continue because those books are really a reflection of what we are doing and what we are yet to do. So, if we continue I know we can develop. The major thing is not to take recording lightly because if that happens you can be forgetting to record.
- E01 - 169** maybe there is another one to add something. Can anyone of you give an example of something you never used to do before learning which you now do due to the knowledge you got from the workshops we were having or you can tell us that we just do things just the same as we used to do before learning? Is there a difference before learning and after learning terms of how you do things?
- P22 - 170** the way I do things now is different from the way I used to do before learning. This time I calculate properly the money I use per month because I do record every month unlike those days I never had the book. We never also used to do a proper budgeting hence we were just careless but now we are careful. We thank you for the knowledge you have brought for us.
- E01 - 171** okay let **P17** say something too.
- P17 - 172** just as the former speaker said, we never used to take account of how we use the money. But from the time we started learning we have now started budgeting properly and we now take account of money we spent.
- E01 - 173** alright yes.
- P22 - 174** we also used to plan to say when I have money I will do this and that but when we find money we used to forget about the plans we have rather we used to spend the money on something different. But now we work towards the set goals/targets unless we have a big problem that's when part of the money can be used to solve that problem.
- E01 - 175** alright
- P22 - 176** we have started achieving some of our set goals because of being focused.
- E01 - 177** give us an example of goals you have achieved.
- P22 - 178** I promised to finish building my house which am working on and am finishing it before November.
- E01 - 179** okay that's interesting and what of you **P14**?
- P14 - 180** am yet to sell my groundnuts so that I buy maize seed for the coming farming season.
- E01 - 181** are you selling now?
- P14 - 182** yes, am selling
- E01 - 183** how much is a 50 kg bag?
- P14 - 184** its k100
- E01 - 185** and then how many bags of groundnuts do you have?
- P14 - 186** I have 8 * 50 kg bags
- E01 - 187** okay
- P17 - 188** I had set a goal of building a house but that wasn't achieved of which I just thought of buying inputs for the next farming season.
- E01 - 189** how far have you gone in buying those inputs?
- P17 - 190** for now, I have just bought 20 kg of maize seed and yet to buy fertilizer.
- E01 - 191** do you already have money for fertilizer?
- P17 - 192** yes, and I also paid towards farmers input support program (FISP). I pray that I will get something.

E01 - 193 okay. What of you madam there?

P15 - 194 as for me it's just building a house with my husband which we are doing.

E01 - 195 pass the recorder to Mr. **P20**.

P20 - 196 I had promised to buy a cow which I never managed to do but I also just bought 50 kg maize seed and 6*50 kg bags of fertilizer. I thought of buying inputs so that if I produce well next year I will still fulfil my promise/goal of buying a cow.

E01 - 197 okay thank you so much. We now go to the next part of our meeting but when these who are still on their way arrive they will be given a chance also to tell us the benefits and the challenged they faced.

P22 - 198 yes

E01 - 199 the main focus of this program was to educate one another so we thought to say, for us to change the way farmers think what methods can we use? I had gone to Norway because **E02** couldn't manage to come due to her not having money for the flight. We discussed and she told me that on our part we are done and it's up to the farmers to either continue using the knowledge given to them or not. She said she doesn't know what the future holds because they might come again even for something different next time. Then I said we can't just stop like that but we need to go and say bye to the farmers so that if it happens that we go again they should not be surprised to say after a long time this is when you are coming again. She also liked the idea and that's why we have come here. The discussions we used to have were all sent to them and there were some observations. We discovered that there are three groups amongst yourselves, the first one is for those of you who used to record nearly in all the

months, the second one is for those of you who recorded half plus of the months and the last one is for those of you who never used to record such that the book is almost empty in most of the months. It was also observed that some of you work together in terms of recording and **E02** was very happy with you who do that. When the research assistants came last time, we told them to interview ten families of farmers around here who are not under this program. The reason is for us to compare how they do things and how you do things also. It was noted that there is a big difference between them and those of you who used to record in nearly every month in terms of planning. Those who are not part of this program do not write their plans anywhere which you do. They were like we know how we do things all the time hence no need of writing but what they forget is that as human beings we are bound to forgetting hence not knowing if you are progressing or not. Planning and budgeting you are really doing well compared to those who are not part of this program. They were happy to notice this difference just after short time of teaching you. But when we come to group three were some of you belong, there is no much difference in the way you do things with those who are not part of this program because you never used to record every month. If you don't record this month you can't assess your progress hence just being like those we never taught. But to those of you who record every month you are so different from those who are not part of this program in the way you do things because you assess yourselves. Less I forget have

you already received inputs from FISP?

P00 - 200 no

E01 - 201 when coming I was actually talking to the research assistants about when the inputs will be delivered to farmers, then I said this is what we were teaching to say you should not rely too much on government but in the near future you need to be independent. We should be able to buy inputs from your own money so that the inputs from FISP are just used as a supplement. If we continue relying on FISP we and our children will be stuck someday. Before we conclude let us give time to these who have just come to give tell us the benefits they found from the workshops and the book, also the challenges they faced. If it never helped you in any way just tell us don't be afraid. You just say this program didn't help me due to this and that.

P16 - 202 there are no challenges as to me because that book you gave me is a reminder of what I need to do every day. I write my plans in that same book.

E01 - 203 okay

P16 - 204 at the end of each month we record and compare with last month to see if we are improving or not.

E01 - 205 okay

P15 - 206 I never found any challenge

E01 - 207 okay

P15 - 208 we always used to rely on the government for inputs but now we are able to buy inputs on our own due to the knowledge you brought.

E01 - 209 how did this program help you to achieve your goals or what goals did you achieve and the one you didn't?

P15 - 210 I budget properly now unlike before learning.

E01 - 211 what of you, what example can you give us of what you achieved and what you didn't?

P16 - 212 I bought 5 goats plus 3 chickens after doing business

and am still working towards completing building a shop. Those are my achievements.

E01 - 213 okay

P16 - 214 yes, I have goats and chickens now.

P22 - 215 you are building a shop?

P16 - 216 yes, so that I can be getting some cash from it too.

E01 - 217 okay. So, as I said earlier the program have come to any end but we don't know what might happen in future we might come again and these are words from **E02**. As for today we have thought otherwise, we were supposed to be here around 09:00 hours and knowing that our meeting won't take long we didn't bring any food today. We just thought to say since we are closing the program today each one should receive something after which they need to sign for us. We hope that the little you will be given won't be taken for beer drinking but it will go towards filling up the cup for inputs. So, you will be given k 100 each of which after receiving you need to sign to prove that you have gotten. We nearly went back with the money because you were no were to be seen. But am glad you came even though late. For those who are absent some of you need to sign for them and receive the money on their behalf. **E05** you can give them but make sure they sign.

E05 - 218 okay

E01 - 219 **E02** is so happy and was saying thank you for allowing her to work with you.

E05 - 220 Mr. **P22** sign for **P19** too and miss **P16** sign for **P21**.

E01 - 221 but we don't want to receive calls to say they only signed but they didn't give me the money.

P00 - 222 No, they will be given

E01 - 223 because you might say let me use the money and I will pay back when I have.

P00 - 224 no

E01 - 225 but it's not in order to be giving money no, we are just allowed to give you incentives like soap, sugar, or food but we just thought that you can add on to what you have as you prepare for the coming farming season.

P15 - 226 thank you so much though we are sad that the program has ended.

P22 - 227 it's bad that the program has ended

E01 - 228 no, they might come back again. And those books are your please use them.

P00 - 229 thank you

E01 - 230 this is where our meeting ends and let someone close in prayer.

P22 - 231 Mr. **P20** pray for us.

P20 - 232 *Praying*
Thank you so much.

Appendix 5. Follow-up table

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
P01 (A)	Livestock	1 st	<ul style="list-style-type: none"> Bought some livestock Bought salt (medicine) 	<ul style="list-style-type: none"> Lost many livestock in the previous year Salt is used for deworming (disease prevention) 	<ul style="list-style-type: none"> Buy cows and chickens
		2 nd	<ul style="list-style-type: none"> Bought salt (medicine) 	<ul style="list-style-type: none"> Salt is used for deworming 	<ul style="list-style-type: none"> Sell goats in order to buy iron sheets (for the roof of the house) – livestock business
		3 rd	-	-	-
	Cash	1 st	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Busy harvesting 	<ul style="list-style-type: none"> Keep cash in the asset form
		2 nd	<ul style="list-style-type: none"> Joined OSAWA (lending group) 	<ul style="list-style-type: none"> Get a loan 	<ul style="list-style-type: none"> To buy iron sheets (for the house)
		3 rd	-	-	-
	Food Security	1 st	<ul style="list-style-type: none"> Avoided Carelessness 	<ul style="list-style-type: none"> To sell food when the price rises 	<ul style="list-style-type: none"> Reserve a big amount of food so after she can hire labour (piecework) and reserve some for household consumption
		2 nd	<ul style="list-style-type: none"> Reserved more maize 	<ul style="list-style-type: none"> To sell food when the price rises 	<ul style="list-style-type: none"> Sell maize
		3 rd	-	-	-
	Land	1 st	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Still harvesting 	<ul style="list-style-type: none"> Cut down trees on a dormant land in order to burn them, so the ashes can be used to improve the soil fertility
		2 nd	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> No manure 	<ul style="list-style-type: none"> Practice crop rotation
		3 rd	-	-	-
P02 (A)	Livestock	1 st	<ul style="list-style-type: none"> Deworming Dipping Counted the livestock 	<ul style="list-style-type: none"> Disease prevention Control the number of livestock 	<ul style="list-style-type: none"> Bring her animals together from the people she had given
		2 nd	<ul style="list-style-type: none"> Dipping 	<ul style="list-style-type: none"> Disease prevention 	<ul style="list-style-type: none"> Sell livestock – livestock business
		3 rd	-	-	-
	Cash	1 st	<ul style="list-style-type: none"> Sold cattle (livestock) Sold groundnuts 	<ul style="list-style-type: none"> Pay personal expenses – school and medical check-up 	<ul style="list-style-type: none"> Sell crops after harvest
		2 nd	<ul style="list-style-type: none"> Sold groundnuts and sunflower 	<ul style="list-style-type: none"> Earn cash 	<ul style="list-style-type: none"> Sell chickens – livestock business
		3 rd	-	-	-
	Food Security	1 st	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Waiting to finish harvesting 	<ul style="list-style-type: none"> Store enough food for household consumption and for sales business
		2 nd	<ul style="list-style-type: none"> Produced food for household consumption and selling 	<ul style="list-style-type: none"> Avoid the need to food purchase 	<ul style="list-style-type: none"> Store enough food for household consumption and for sales business
		3 rd	-	-	-

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
	Land	1 st	• Winter ploughing burying the grass	• No other option	• Apply manure from livestock (inputs)
		2 nd	• N/A	• Not the right time to apply manure	• Apply manure
		3 rd	-	-	-
P03 (A)	Livestock	1 st	• Made nest for chickens (good care)	• Having a place to lay the eggs	• Continue taking good care
		2 nd	• N/A	• N/A	• Disease prevention and good care
		3 rd	• Bought livestock – chickens and guinea fowls (P03-61 p.5)	-	-
	Cash	1 st	• Sold groundnuts – groundnuts business	• Pay personal expenses – school	• Selling crops after harvesting
		2 nd	• Sold charcoal – charcoal business	• Pay personal expenses – school	• Continue doing charcoal business
		3 rd	-	-	-
	Food Security	1 st	• N/A	• No money to buy food	• Eating what from her own harvest
		2 nd	• Bought maize	• To increase the available food	• Proper storage
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Apply manure after harvesting
		2 nd	• Bought groundnuts seed	• Groundnuts do not require manure	• Waiting for the rain season so that she plants the groundnuts
		3 rd	• Bought groundnuts seed (P03-61 p.4) • Gardening (P03-64 p.5)	-	-
P04 (A)	Livestock	1 st	• Built a house for the goats (good care)	• To prevent the livestock to destroy the crops	• Livestock business
		2 nd	• Dipping – disease prevention	• Disease prevention	• Continue with the disease prevention
		3 rd	-	-	-
	Cash	1 st	• N/A	• The harvest was not good so wanted to invest the cash on food	• Selling fish – livestock business
		2 nd	• Sold maize	• To buy food – soup and relish	• Charcoal business
		3 rd	-	-	-
	Food Security	1 st	• N/A	• Had enough for the family	• Proper storage of the food
		2 nd	• Stored food	• To have enough for the family	• Proper storage of the food
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Continue with the crop rotation
		2 nd	• N/A	• Just used fertilizer	• Apply fertilizer
		3 rd	-	-	-
P05 (A)	Livestock	1 st	• N/A	• Busy harvesting	• Buy livestock after harvesting
		2 nd	• Bought goat and chickens – livestock	• Increase the number of livestock	• Buy a cow

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
		3 rd	• Bought chickens – livestock (P05-55, p.4)	-	-
	Cash	1 st	• Charcoal business	• Pay personal expenses – school	• Planning to save money through the bank (savings)
		2 nd	• Took the money from the bank (savings)	• Pay personal expenses - school	• Charcoal Business
		3 rd	-	-	-
	Food Security	1 st	• Had food for household consumption and for selling	• To avoid hunger	• Find alternatives to improve the amount of food
		2 nd	• Proper storage of maize • Bought groundnuts	• To avoid pests • Sell the groundnuts – groundnuts business	• Store maize to sell after
		3 rd	-	-	-
	Land	1 st	• N/A	• Waiting for the right time to harvest	• Practice crop rotation • Apply manure from livestock
		2 nd	• Applied manure from livestock	• To improve land fertility	• Practice crop rotation
		3 rd	-	-	-
P06 (A)	Livestock	1 st	• N/A	• Lack of money	• Sell maize in order to buy disease prevention for the goats
		2 nd	• Sold goats – livestock business	• Pay personal expenses – school, buy clothes	• Buy chemicals • Disease prevention
		3 rd	•	•	•
	Cash	1 st	• Lent money for others	• To profit due to the interests	• Start a business/commerce – selling salt, cooking oil cabbage
		2 nd	• Charcoal business • Lent money for others	• Pay for fertilizer • Pay personal expenses	• Continue doing charcoal business
		3 rd	• Hired labour (piecework) (P06-59 p. 5)	• To cultivate when the rain season	-
	Food Security	1 st	• Minimized on barter exchange • Starting savings	• Because food would deplete	• Buy personal expenses – soap, lotion
		2 nd	• Proper storage • Avoided carelessness	• Ensure food security	• Gardening – to sell vegetables • Charcoal business to buy inputs and selling maize
		3 rd	• Bought groundnuts seed (P06-59 p. 5) • Gardening (P06-67 p. 5)	-	-
	Land	1 st	• N/A	• Still harvesting	• Apply manure
		2 nd	• N/A	• Waiting for the rain season	• Apply manure from livestock • Apply fertilizer

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
		3 rd	• Bought inputs (P06-59 p.5)	-	-
P07 (A)	Livestock	1 st	• Sold livestock • Bought disease prevention	• To solve personal problems	• Does not know
		2 nd	• Bought a goat – livestock	• Increase livestock	• Provide clean water – good care • Disease prevention
		3 rd	• Bought guinea fowls – livestock (P07-53 p.4)	-	-
	Cash	1 st	• Cash from livestock business • Bought maize	• To solve personal problems	• Start a new business/commerce
		2 nd	• Sold food (cooking oil)	• To earn cash	• Continue selling cooking oil
		3 rd	• Sold maize (P07-77 p.5)	• To earn cash (P07-77 p.5)	-
	Food Security	1 st	• N/A	• Still harvesting	• Avoiding carelessness
		2 nd	• Storage enough food	• Ensure food security	• Doing business so she will not need to sell food
		3 rd	-	-	-
	Land	1 st	• N/A	• Waiting for rain season	• Apply fertilizer • Apply manure from livestock
		2 nd	• N/A	• She only uses fertilizer	• Buy fertilizer
		3 rd	• Bought maize seed (P07-53 p.4)	• To sell and earn cash (P07-77 p.5)	-
P08 (A)	Livestock	1 st	• Bought medicine – disease prevention	• Cows were sick	• Buy livestock (cow and goats)
		2 nd	• Bought livestock (goat and chicken)	• Increase livestock number	• Buy livestock (cows)
		3 rd	• Reared chicken (P08-45 p.4)	-	-
	Cash	1 st	• Sold cotton	• Earn cash to buy food	• Starting commerce – fritters
		2 nd	• Sold maize	• Earn cash to buy livestock	• Continue selling fish
		3 rd	-	-	-
	Food Security	1 st	• Bought food	• To add on the harvested food	• Buy more food to add on the harvested
		2 nd	• Produced food • Proper storage • Bought relish	• Ensure food security	• Proper storage
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Apply lime
		2 nd	• N/A	• No money to buy lime	• Practice crop rotation • Apply fertilizer
		3 rd	• Bought fertilizers (P08-45 p.4) • Bought groundnuts seeds (P08-45 p.4)	• To use in the following season (P08-45 p.4)	-

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
P09 (A)	Livestock	1 st	<ul style="list-style-type: none"> Deworming Dipping counted 	<ul style="list-style-type: none"> Disease prevention Control the number of livestock 	<ul style="list-style-type: none"> Change the breed, especially for beef
		2 nd	<ul style="list-style-type: none"> Disease prevention 	<ul style="list-style-type: none"> To reduce diseases To buy more livestock 	<ul style="list-style-type: none"> Increase the livestock so he can sell later – sales business
		3 rd	-	-	-
	Cash	1 st	<ul style="list-style-type: none"> Sold food (maize) 	<ul style="list-style-type: none"> Pay personal expenses – school, household expenses 	<ul style="list-style-type: none"> Sell produced food Sell livestock – livestock business
		2 nd	<ul style="list-style-type: none"> Sold livestock Sold maize 	<ul style="list-style-type: none"> To buy inputs 	<ul style="list-style-type: none"> Sell maize and buy livestock
		3 rd	<ul style="list-style-type: none"> Budgeting properly – savings (P09-51 p.4) 	<ul style="list-style-type: none"> To manage the money better (P09-51 p.4) 	-
	Food Security	1 st	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Still harvesting 	<ul style="list-style-type: none"> Store enough food for household consumption and for sale business
		2 nd	<ul style="list-style-type: none"> Produced food for household consumption 	<ul style="list-style-type: none"> Ensure food security 	<ul style="list-style-type: none"> Maintain and keep food for household consumption and sell the food surplus
		3 rd	-	-	-
	Land	1 st	<ul style="list-style-type: none"> winter ploughing burying the grass 	<ul style="list-style-type: none"> No other option 	<ul style="list-style-type: none"> Apply manure from livestock
		2 nd	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Waiting for the rain season 	<ul style="list-style-type: none"> Apply manure from livestock
		3 rd	<ul style="list-style-type: none"> Bought inputs (P09-51 p.4) 	-	-
P10 (A)	Livestock	1 st	<ul style="list-style-type: none"> Bought medicine 	<ul style="list-style-type: none"> Disease prevention 	<ul style="list-style-type: none"> Buy a cow
		2 nd	<ul style="list-style-type: none"> Bought livestock (goat) Dipping 	<ul style="list-style-type: none"> Increase livestock Disease prevention 	<ul style="list-style-type: none"> Provide clean water (good care) and dipping (disease prevention)
		3 rd	•	•	•
	Cash	1 st	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Still harvesting 	<ul style="list-style-type: none"> Sell produced food
		2 nd	<ul style="list-style-type: none"> Sold food (vegetables and maize) 	<ul style="list-style-type: none"> Pay personal expenses – school 	<ul style="list-style-type: none"> Continue with gardening
		3 rd	<ul style="list-style-type: none"> Sold food (P10-30 p.3) 	<ul style="list-style-type: none"> Earn cash (P10-30 p.3) 	<ul style="list-style-type: none"> Buy okra seed to sell in the next season (P10-42 p.4) Open a bank account (P10-71 p.5)
	Food Security	1 st	<ul style="list-style-type: none"> Bought food (maize) 	<ul style="list-style-type: none"> Add to the harvested food (available food) Ensure food security 	<ul style="list-style-type: none"> Buy more maize
		2 nd	<ul style="list-style-type: none"> Bought food (maize) 	<ul style="list-style-type: none"> Add to the harvested food (available food) 	<ul style="list-style-type: none"> Proper storage of food
		3 rd	•	•	•

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
	Land	1 st	• N/A	• Still harvesting	• Apply manure from livestock • Plant soya beans to improve the soil fertility
		2 nd	• N/A	• Used to apply fertilizer	• Buy fertilizer
		3 rd	• Gardening (P10-69 p.5)	• To sell and earn money (P10-69 p.5)	•
P11 (A)	Livestock	1 st	• Bought livestock (goat)	• Goats reproduce fast so that he can start a livestock business	• Buy a cow
		2 nd	• Slaughtered some chickens	• For eating	• Buy livestock
		3 rd	-	-	-
	Cash	1 st	• Sold food (maize, pumpkins, groundnuts) • Resell fish	• Earn enough money to not have to sell the produced food	• Continue doing the fish business in order to buy inputs
		2 nd	• Sold food (maize)	• Earn cash	• Continue selling maize
		3 rd	-	-	-
	Food Security	1 st	• Sold crops • Bought beans • Bought kapenta (to resell)	• Earn money to buy relish	• Increase the food reserved • Start gardening
		2 nd	• Proper storage	• To avoid losing available food	• Avoid carelessness with food
		3 rd	-	-	-
	Land	1 st	• N/A	• Chicken manure was not enough	• Continue doing crop rotation
		2 nd	• N/A	• Avoiding weeds	• Liming
		3 rd	-	-	-
P14 (B)	Livestock	1 st	• Bought medicine	• Cure a disease which attached the chickens	• Good care • Increase livestock
		2 nd	-	-	-
		3 rd	-	-	-
	Cash	1 st	• N/A	• Waiting to sell the crops	• Start a business after selling maize
		2 nd	-	-	-
		3 rd	• Sold groundnuts (P14-180 p.10)	• To buy maize seed (P14-180 p.10)	-
	Food Security	1 st	• Dividing the food available – for household consumption and for sell	• To know how much food she can sell	• Buy more food
		2 nd	-	-	-
		3 rd	-	-	-
	Land	1 st	• Applied manure in the land	• To improve soil fertility	• Crop rotation
		2 nd	-	-	-
		3 rd	-	-	-

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
P15 (B)	Livestock	1 st	• N/A	• Lack of money	• Buy a chicken
		2 nd	• Bought livestock – goat and chicken	• For reproducing and sell – livestock business	• Good care
		3 rd	-	-	-
	Cash	1 st	• Sold groundnuts	• Pay personal expenses – spare parts for the bicycle	• Selling fish business
		2 nd	• Sold food (maize)	• Earn cash	• Groundnuts business
		3 rd	• Building a house (P15-194 p.10) • Savings (P15-210 p.12)	-	-
	Food Security	1 st	• N/A	• Still harvesting • Had enough food	• Proper storage of the food
		2 nd	• Sold food (groundnuts and maize)	• Pay the membership fee for the cooperative	• Buy kapenta and beans for relish
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Ripping
		2 nd	• Took soya beans residues	• To improve land fertility	• Apply fertilizer
		3 rd	• -	• -	• -
P16 (B)	Livestock	1 st	• Bought livestock (goats and chickens)	• Invest in livestock	• Buy more livestock (goats)
		2 nd	• Bought livestock • Disease prevention	• Increase the number of livestock	• Continue the disease prevention • Continue to buy livestock
		3 rd	• Bought livestock (goat and chickens) (P16-212 p.12)	-	-
	Cash	1 st	• Bought maize for reselling	• Earn cash	• Saving for build a kitchen
		2 nd	• Business	• She is used to do business	• Continue doing business
		3 rd	• Business (P16-212 p.12)	• Earn cash (P16-212 p.12)	• Build a shop (P16-212 p.12)
	Food Security	1 st	• Bought food (beans, cooking oil, fish) for relish	• It is hard looking for relish after harvested	• Start growing vegetables for relish
		2 nd	• Proper storage • Bought more food	• To reduce the food purchases	• Avoid carelessness in food
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Buy lime • Apply manure from livestock
		2 nd	• N/A	• Will start applying manure later	• Apply fertilizer
		3 rd	-	-	-

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
P17 (B)	Livestock	1 st	• Bought livestock (goats)	• Increase the number of livestock	• To do livestock business and build a house
		2 nd	• Disease prevention	• Increase the number of livestock	• Buy more livestock
		3 rd	-	-	-
	Cash	1 st	• Sold food (maize)	• It was the only way to start up what she had lost	• Continue doing livestock business and start another one
		2 nd	• Bought assets	• Wanted to equip the house	• Get a loan
		3 rd	-	-	-
	Food Security	1 st	• N/A	• Already harvested but she will not sell	• Sell cotton and buy more food
		2 nd	• Proper storage • Bought food	• Ensure food security	• Avoid carelessness
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Apply livestock manure
		2 nd	• N/A	• Applied fertilizer	• Apply fertilizer after planting
		3 rd	• Bought inputs (P17-188 p.10)	• To plant in the next season (P17-188 p.10)	-
P18 (B)	Livestock	1 st	• N/A	• She does not have livestock	• She does not know
		2 nd	• N/A	• Lack of money to buy livestock/medicine	• Buy chickens (livestock)
		3 rd	-	-	-
	Cash	1 st	• N/A	• Still waiting to be paid by the people she worked for (piecework)	• She will wait to be paid so she can spend the money
		2 nd	• Sold grass	• Pay personal expenses	• Continue selling grass
		3 rd	-	-	-
	Food Security	1 st	• Receiving maize as a piecework payment	• Increase the available food	• Keep cultivating
		2 nd	• Proper storage	• Increase the available food time	• Take good care of food – avoid carelessness and proper storage
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Crop rotation
		2 nd	• N/A	• She did not have where to find manure	• Buy fertilizer
		3 rd	-	-	-
P19 (B)	Livestock	1 st	• N/A	• No money to buy	• Buy a cow
		2 nd	• Bought livestock (chicken)	• Increase the number of livestock due to reproduction	• Buy more chickens

Part.		Follow-up	Action taken	Reasons	What happens next/way forward
		3 rd	-	-	-
	Cash	1 st	• N/A	• Did not sell yet the legume crops	• Open a bar and a shop so he can earn cash
		2 nd	• Sold crops	• Earn cash	• Charcoal business
		3 rd	-	-	-
	Food Security	1 st	• Sold food (maize) • Bought food for relish	• Because there was some illness • Beans is one of his favourites foods	• Increase the food reserved
		2 nd	• Proper storage	• Increase the available food time	• To buy beans
		3 rd	-	-	-
	Land	1 st	• N/A	• Still harvesting	• Take legumes residues to his fields (manure)
		2 nd	• N/A	• Not ready	• Apply livestock manure
		3 rd	-	-	-
P20 (B)	Livestock	1 st	• N/A	• No money available	• After selling the crops wants to buy livestock
		2 nd	• Disease prevention	• Increase the livestock health	• Buy more livestock
		3 rd	-	-	-
	Cash	1 st	• N/A	• Waiting for harvesting	• Open a bank account – savings • Invest on maize business
		2 nd	• Business	• Pay personal expenses	• Does not know
		3 rd	-	-	-
	Food Security	1 st	• N/A	• Waiting for harvesting	• Proper storage • Hire labour next season (piecework)
		2 nd	• Proper storage	• Ensure food security	• Avoid carelessness
		3 rd	-	-	-
	Land	1 st	• N/A	• Waiting for harvesting	• Buy lime
		2 nd	• Bought fertilizer	• Improve land fertility	• Apply fertilizer after planting
		3 rd	• Bought maize seed (P10-196 p. 10) • Bought fertilizer (P10-196 p. 10)	• To use in the following season (P10-196 p. 10)	• Sell the produced food and buy a cow (P10-196 p. 10)
P21 (B)	Livestock	1 st	• Bought livestock (chickens and goat)	• Increase the number of livestock	• Keep increasing the number of livestock
		2 nd	• Sold livestock (cow)	• To solve personal problems	• Buy cattle to use as input – oxen
		3 rd	-	-	-
	Cash	1 st	• Sold tomatoes • Sold butter nuts	• Earn cash	• Continue to sell gardening products
		2 nd	• Bought hammer mill	• Earn cash	• Continue with gardening

Part.		Follow-up	Action taken	Reasons	What happens next/way forward	
		3 rd	-	-	-	
	Food Security	1 st	<ul style="list-style-type: none">Produced foodBought food (beans and fish for relish)	<ul style="list-style-type: none">Ensure food security	<ul style="list-style-type: none">Increase the food reserved – proper storage	
		2 nd	<ul style="list-style-type: none">Reserved more food than enough (maize) – proper storage	<ul style="list-style-type: none">Increase the available food timeSell maize to buy relish	<ul style="list-style-type: none">Crop diversity	
		3 rd	<ul style="list-style-type: none">Gardening	-	-	
	Land	1 st	<ul style="list-style-type: none">Applied manure	<ul style="list-style-type: none">Increase the land fertility	<ul style="list-style-type: none">Continue adding manurePlant musangu treesAdd lime	
		2 nd	<ul style="list-style-type: none">Applied manure	<ul style="list-style-type: none">Increase the land fertility	<ul style="list-style-type: none">Apply fertilizer when planting	
		3 rd	-	-	-	
	P22 (B)	Livestock	1 st	-	-	-
			2 nd	<ul style="list-style-type: none">Dipping (disease prevention)	<ul style="list-style-type: none">Disease prevention	<ul style="list-style-type: none">Buy more livestock
3 rd			-	-	-	
Cash		1 st	-	-	-	
		2 nd	<ul style="list-style-type: none">Sold food (maize)	<ul style="list-style-type: none">Buy inputsContinue building his house	<ul style="list-style-type: none">Does not know	
		3 rd	<ul style="list-style-type: none">Sold maize (P22-93 p.7)	<ul style="list-style-type: none">Buy inputs (P22-93 p.7)	<ul style="list-style-type: none">Finish to build his house	
Food Security		1 st	-	-	-	
		2 nd	<ul style="list-style-type: none">Reserved enough food and money for food purchases	<ul style="list-style-type: none">Depends on selling crops for other programs	<ul style="list-style-type: none">Avoid carelessness	
		3 rd	<ul style="list-style-type: none">Produced food for household consumption and for selling (P22-93 p.7)	-	-	
Land		1 st	-	-	-	
		2 nd	<ul style="list-style-type: none">N/A	<ul style="list-style-type: none">Waiting for the rain season	<ul style="list-style-type: none">Ripping the landApply manureApply fertilizer	
		3 rd	<ul style="list-style-type: none">Bought inputs (P22-93 p.7)	-	-	

Appendix 6. Coding Charts workshop A

Main argument:		What to do with cash?						
Casual structure:	Cause variable:	Cash	Cash	Cash	Cash	Cash	Cash	Cash
	Effect variable:	Land Owned/Rented and Inputs	Livestock	Water	Personal Expenses (luxury, school)	Disease Prevention (livestock)	Food Purchases	Savings
	Relationship type:	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P07 – 48 p.104 P09 – 78 p.104/105 P06 – 105 p.106	P07 – 48 p.104	P09 – 78 p.104/105	P06 – 105 p.106	P09 – 113 p.104/105	P06 – 149 p.108	P07 – 391 p.117
Notes:		Start farming and land maintenance	Keeping livestock	Water maintenance	Luxury, school	“(…) there is cash for livestock, there is some medicine needed for livestock so that your livestock can increase (...)”	“Because on cash again if this side you don’t have food, you will finish the cash by buying food (...)”	“(…) then we started budgeting, and have now started saving; having our own bank accounts where to save (...)”
Information source:		Comments heard from the revision of the previous workshop (2015)						Comments heard from the feedback from participants

Main argument:		How to increase/decrease cash?				
Casual structure:	Cause variable:	Food Surplus	Livestock	Piecework	Avoiding Carelessness	Trees
	Effect variable:	Cash	Sales “Business”	Cash	Cash	Cash
	Relationship type:	Positive	Positive	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P09 – 78 p.104/105	P06 – 105 p.106	P10 – 173 p.109	E01 – 211 p.111/112	P01 – 342 p.115
Notes:		“(…) selling that food, yes you can sell some and leave some for food (...)”	“(…) sell the old livestock in order to buy small ones”	N/A	Not buying anyhow	“I went in the bush to cut trees, burnt charcoal and I got cash”
Information source:		Comments heard from the revision of the previous workshop (2015)				Comments heard from the feedback from participants

Main argument:		How to get food?					
Casual structure:	Cause variable:	Livestock	Land (productive land)	Rain/Water	Abusive Sales	Avoiding Carelessness	Livestock (oxen)
	Effect variable:	Land (productive land)	Produced Food	Produced Food	Available Food	Available Food	Produced Food
	Relationship type:	Positive	Positive	Positive	Negative	Positive	Positive
Speaker name; CIN; Transcription page:		P09 – 78 p.104/105			P09 – 113 p.106/107 P04 – 171 p.109	P09 – 113 p.106/107	P12 – 1141/1143 p. 137
Notes:		Help to improve farming	N/A	“Water, rains are needed for farming and after all these you look at what you have gained from farming and that should be food”	“reserve enough for consumption (...) but enough to sell” Store more food in case of unforeseen circumstances (Household Consumption)	“On the part of food, it should also be managed well because there are pests that destroy..... we should be buying medicine to prevent or treat our food so that it can be free from pests”	They need oxen (input) to help cultivate and produce food
Information source:		Comments heard from the revision of the previous workshop (2015)					

Main argument:		How to improve land fertility/farming?					
Casual structure:	Cause variable:	Inputs	Rain/Water	Crop Rotation	Crop Diversity	Weeding	Rain
	Effect variable:	Land (productive land)	Land (productive land)	Land (productive land)	Land (productive land)	Land (productive land)	Land (productive land)
	Relationship type:	Positive	Positive	Positive	Positive	Positive	Negative
Speaker name; CIN; Transcription page:		P09 – 78 p.104/105		P09 – 113 p.106/107			P02 – 324 p.115
Notes:		N/A		“(…) if you over-use the land, it loses its fertility (…) why we learnt that we should be practicing crop rotation”	“we should be planting different crops not one crop every year on the same field, it will be destroyed”	“(…) we suggested that we should be weeding”	“(…) floods destroy crops”
Information source:		Comments heard from the revision of the previous workshop (2015)					Comments heard from the feedback from participants

Main argument:		How to increase livestock?			
Casual structure:	Cause variable:	Cash	Good Care	Disease Prevention	Breeding
	Effect variable:	Livestock	Livestock	Livestock	Livestock
	Relationship type:	Positive	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P07 – 48 p.114	P09 – 78 p.104/105	P06 – 105 p.106	P09 – 187 p.110
Notes:		Keeping livestock	“to make sure that they (livestock) help you and you should also take care of them.”	“(…) there is some medicine needed for livestock so that your livestock can increase (…)”	“for cattle to be increasing, to be reproducing your desire should be that you look for a breed which is good (…)”
Information source:		Comments heard from the revision of the previous workshop (2015)			

Main argument:		How to increase livestock?			
Casual structure:	Cause variable:	Cash	Good Care	Disease Prevention	Breeding
	Effect variable:	Livestock	Livestock	Livestock	Livestock
	Relationship type:	Positive	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P07 – 48 p.2	P09 – 78 p.104/105	P06 – 105 p.106	P09 – 187 p.110
Notes:		Keeping livestock	“to make sure that they (livestock) help you and you should also take care of them.”	“(…) there is some medicine needed for livestock so that your livestock can increase (…)”	“for cattle to be increasing, to be reproducing your desire should be that you look for a breed which is good (…)”
Information source:		Comments heard from the revision of the previous workshop (2015)			

Main argument:		Scenario “No rain and without any help from the government”																								
Casual structure:	Cause variable:	Gardening	Rain	Water	Feed	Avoiding Carelessness	Livestock	Rain	Charcoal	Cash	Breeding	Feed (grazing)	Disease Prevention	Livestock	Charcoal	Charcoal	Charcoal	Legislation for Deforestation	Groundnuts	Groundnuts	Groundnuts	Groundnuts	Groundnuts	Cash	Cash	Commerce
	Effect variable:	Available Food	Gardening	Livestock	Livestock	Available Food	Inputs (manure, oxen)	Retention Basins	Cash	Livestock (cattle)	Livestock (cow)	Livestock	Livestock	Cash	Land (productive land)	Rain/Water	Health	Charcoal Business	Inputs	Household Consumption	Health	Cash	Available Food	Livestock	Personal Expenses (clothes)	Cash
	Relationship type:	Positive	Positive	Positive	Positive	Positive	Positive	Negative	Positive	Positive	Positive	Positive	Positive	Positive	Negative	Negative	Negative	Positive/Negative	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P02 – 708 p.127	P05 – 717 p.127/128			P09/P08 – 913/920 p.132	P12 – 1234/1236 p.140	P05 – 1238 p.140	P12 – 1385/1398 p.143	P09 – 1386 p.243	P06 – 1401 p.143	P06 – 1409 p.143	P09 – 1415 p.143	E01 – 1418 p.143	P09 – 1533 p.148	P09/P10 – 1535/1538 p.148	P09 – 1625 p.149	P10 – 1660 p.150/151	P09 – 1525/1527 p.148	P09 – 1529 p.148	P09 – 1625 p.149	P09 – 1531 p.148	P09 – 1542/1560 p.148	P09 – 1456 p.144		P05/P09 – 1462/1469 p.144
Notes:		N/A	(...) I can not do even a garden because there are no rains meaning there is no water”	“even a cow needs water and grass (...)”		Family planning; no polygamy; no unnecessary drinking beer	Manure from livestock/Oxen	(...) in times of little rain fall use retention basins”	N/A	From the Charcoal Business cash is possible to buy cattle (livestock)	“if you are lucky that cow starts reproducing”	“taking it out for grazing”	“dipping and deworming”	“you are using that step or way we were saying that in times of difficulties, you can do what... You can sell”	“... when you burn your charcoal that ashes there it can destroy the land and crops cannot grow well”	“(…) water depends on trees” “if trees finish just know that you are creating a desert”	“(…) if we continue with charcoal, even you’re healthy as a human being it reduces”	Headman’s permission to burn charcoal, if the reason is reasonable it would be allowed ; limitation of number of trees; people can lie of their intentions	“they have nutrients to support the crops you planted”	“the same groundnuts we eat at home ”	“(…) growing groundnuts will be a healthy one (...)”	N/A	N/A	“from groundnuts, they find a lot of money even a cow they can buy but they only buy clothes”	Start a business – Sewing or selling flitters	
Information source:		Comments heard from the workshop scenario exercise																								

Appendix 7. Coding Charts workshop B

Main argument:		What to do with cash?						
Casual structure:	Cause variable:	Cash	Cash	Cash	Cash	Cash	Cash	Cash
	Effect variable:	Inputs	Food Purchases	Personal Expenses (sickness, funerals)	Livestock	Savings	Piecework (pay someone to help in the field)	Water (water pump)
	Relationship type:	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P22 – 79 p.161	P17 – 306/308 p.165	P16 – 353/357 p.166	P21 – 365 p.166		P23 – 413 p.167	P21 – 468/470 p.168
Notes:		“(…) we first have cash and then the cash is used to buy inputs”	N/A	Sickness, funerals	Buy Livestock for the Livestock Business	“(…) to budget the money, so that even at home they can also buy some things needed”	“(…) money we give those people for piece work so that they can help us fight the weeds in the field, for the crops to grow (...)”	“I bought a water pump with the little money I got.”
Information source:		Comments heard from the revision of the previous workshop (2015)						Comments heard from the feedback from participants

Main argument:		How to increase/decrease cash?											
Casual structure:	Cause variable:	Sales “Busine ss”	Produc ed Food	Gardeni ng	Avoiding Carelessn ess	Good Care	Climate Change	Piecewo rk (work for others)	Trees (charcoal)	Loan	Livesto ck	Groundn uts	Comme rce (second -hand clothes)
	Effect variable:	Cash	Cash	Cash	Cash (available food)	Cash (livesto ck)	Cash	Cash	Cash	Cash	Cash	Cash	Cash
	Relations hip type:	Positive	Positive	Positive	Positive	Positive	Negative	Positive	Positive/Neg ative	Positiv e	Positiv e	Positive	Positive
Speaker name; CIN; Transcription page:		P16 – 55 p.161	P22 – 81/85 p.161	P22 – 254 p.164	P21 – 275/283 p.164		P21 – 369 p.166	P17 – 415 p.167	P22/P14 – 444/453 p.168	P17 – 522/524 p.169		P14 – 538 p.169/170	P22 – 583 p.171
Notes:		N/A	Sales “Busine ss” from the Food Surplus to earn Cash	Increasi ng gardeni ng increas es the availabl e food and the possibili ty to sell it in order to earn cash	“(…) not taking good care of the food, the livestock there – also not using the land well can make the (cash) cup be half”		“Someti mes just the climate change; unstable weather condition s also reduce the cup for cash at home”	“On piecewo rk, we learnt that if we run short of money, we go out to those people that offer piece work; we work and help ourselv es at home.”	Bring money in a short term but in a long term will affect negatively because they need to cut trees and the trees increase the rain	Loan from AGOR A to start a Livesto ck Busine ss	In this exampl e, the cash came from a loan “(…) that is how I started buying goats and taking to the border to go and sell”	“(…) now maybe I will harvest even 20 bags of groundn uts and the cup for cash will be full when I sell those groundn uts”	Selling second- hand clothes
Information source:		Comments heard from the revision of the previous workshop (2015)								Comments heard from the feedback from participants			

Main argument:		How to get food?					
Casual structure:	Cause variable:	Water	Inputs	Water	Avoiding Carelessness	Rain/Water (floods)	Debt Avoidance
	Effect variable:	Household Consumption	Produced Food	Produced Food	Available Food	Land (productive land)	Available Food
	Relationship type:	Positive	Positive	Positive	Positive	Negative	Positive
Speaker name; CIN; Transcription page:		P20 – 155 p.162	P14 – 228/230 p.163	P14 – 232 p.163	P17 – 304/306 p.165	P21 – 367 p.166	P21 – 371 p.166
Notes:		“We learnt about management of water, which we use for cooking.”	“(…) for land to produce more food, we needed inputs”	“(…) this water or for the land to produce food we need water”	“We learnt that what makes our food reduce is our carelessness”	“(…) If there are floods again, you can do very well but the crops will be destroyed by the floods (…)”	“Then on the cup for food, what can make it reduce even when you had reserved enough are unnecessary debts”
Information source:		Comments heard from the revision of the previous workshop (2015)					

Main argument:		How to improve land fertility/farming?										
Casual structure:	Cause variable:	Inputs	Water	Conservation Farming	Trees	Trees	Liming	Livestock	Weeding	Piecework (work for others)	Crop Diversity	Charcoal
	Effect variable:	Land (productive land)	Land (productive land)	Land (productive land)	Inputs (manure)	Rain	Land (productive land)	Inputs (manure)	Land (productive land)	Land (productive land) (their own land)	Land (productive land)	Rain
	Relationship type:	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Negative	Positive	Negative
Speaker name; CIN; Transcription page:		P21 – 103/106 p.161	P14 – 232 p.163	P22 – 382/394 p.166/167				P14 – 400/402 p.167	P23 – 413 p.167	P14 – 419 p.167	P22 – 425 p.168	P22 – 433/439 p.168
Notes:		“From the inputs, we go to the field and cultivate”	N/A	N/A	“(…) we need to be planting some trees that add manure to the soil” Musangu trees, for example	“We need to be planting trees that add manure so that the cup can be full; the same trees help on the issue of rain”	“Then, these same trees as the Musangu also help in adding lime to the soil”	Manure from the livestock can be used as inputs	“(…) can help us fight the weeds in the field, for the crops to grow (…)”	“we will always just be weeding other people’s fields while our fields suffer in the end hunger shall not spare us.”	“we should not just plant one crop but a number of them, so that if our crop does not sell well, the other will and help again on the same crops”	Because of deforestation caused by the Charcoal Business “You find that the air over blows for it cannot be held back by the trees, if the trees are there it can be blocked, hence the clouds are put together in rain”
Information source:		Comments heard from the revision of the previous workshop (2015)										

Main argument:		How to increase livestock?		
Casual structure:	Cause variable:	Disease Prevention	Cash	Good Care
	Effect variable:	Livestock	Livestock	Livestock
	Relationship type:	Positive	Positive	Positive
Speaker name; CIN; Transcription page:		P20 – 130/134 p.162	P22 – 136 p.162	P21 – 283 p.164
Notes:		Keep/source medicine	“you can increase them by buying some more”	N/A
Information source:		Comments heard from the revision of the previous workshop (2015)		

Main argument:		Scenario “No rain and without any help from the government”																			
Casual structure:	Cause variable:	Gover nment	Char coal	Affore station	Legisla tion for Defore station	Tree s	Produc ed Food	Inputs (manure)/Liming	Cash	Bree ding	Livest ock (chick en)	Crop Rotati on	Crop Diver sity	Buildi ng Hous e	Drillin g Boreh oles	Conser vation Farmin g	Feed	Good Care (plac e to sleep)	Cash	Partners hip	
	Effect variable:	Inputs (fertiliz er)	Food Purch ases	Rain	Trees	Prod uced Food	Cash	Land (producti ve land)	Lives tock (Bree ding)	Live stoc k	Sales “Busi ness”	Land (prod uctive land)	Land (prod uctive land)	Cash (rental “busin ess”)	Rain/ Water	Land (produ ctive land)	Live stoc k	Live stoc k	Good Care (kra al)	Cash	
	Relationship type:	Positiv e	Positi ve	Positiv e	Positiv e	Positi ve	Positiv e	Positive	Positi ve	Positi ve	Positi ve	Positi ve	Positi ve	Positi ve	Positi ve	Positiv e	Positi ve	Positi ve	Positi ve	Positive/ Negative	
Speaker name; CIN; Transcription page:		P24 – 713 p.175	P20 – 785/787 p.176	P22 – 826 p.178	P22 – 856/861 p.178	P20 – 1137/1141 p.184/185		P21 – 869/875 p.178 P16 – 916 p.179 P15 – 1245 p.187	P21/P16 – 887/902 p.179		P16 – 910 p.179	P24 – 924 p.179	P22 – 932 p.180	P22 – 942/950 p.180	P22 – 970 p.180	P22 – 982 p.181	P19/P21 – 1338/1351 p.189/190			P19 – 1491/1493 p. 193	
Notes:		“(…) also, the government was helping us on the part of fertilizer (…)”	“We find money through charcoal so then we can buy food”	“here what we are supposed to do so that in future we benefit is planting trees” (rain pattern)	Rules for cutting down trees	“(…) trees in the field they start shedding off the leaves and when you cultivate you are able to find food”	“On the other part is selling if they grow, you can find profit through those trees” (fruit trees from afforestation)	“When we use manure (from livestock), that thing of waiting to be given fertilizer (from FISP) will reduce and our crops will grow well (…)” Lime Musangu trees	N/A		“(…) I should keep chickens for business, if I want to sell, I just get a vehicle and take to Chibombo to sell”	“(…) changing of crops so that the soil is revamped”	“Planting so many different crops”	Increasing the cash due to the Rental Business	N/A	N/A	“(…) then on the chickens also you build for them where to be sleeping in, the food should be available”			“we get cash and buy one cow or if it’s a goat, if it’s a cow we should build a kraal where it will be sleeping”	Working with someone can be a drawback or a positive thing
Information source:		Comments heard from the workshop scenario exercise – group 1 discussion/explanation																			

Main argument:		Scenario “No rain and without any help from the government”																			
Casual structure:	Cause variable:	Produced Food	Cash	Cash	Livestock (goat)	Cash	Cash	Livestock (goat)	Loan	Piece work	Piecework (ox carts)	Piecework (ox carts)	Legislation for Deforestation	Piecework (ox carts)	Cash	Food Purchases (fritter)	Cash	Livestock (chicken)	Cash	Livestock (chicken)	Abusive Sales
	Effect variable:	Cash	Personal expenses/Household Consumption	Livestock (goat)	Cash	Transportation (goat)	Food Purchases (goat)	Cash	Cash	Livestock (chicken)	Land Owned/ Rented	Water	Trees	Cash	Food Purchases (fritter)	Cash	Livestock (chicken)	Cash	Food Purchases (chicken)	Livestock	
	Relationship type:	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Negative	Negative	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Negative	
Speaker name; CIN; Transcription page:		P19/P22/P16 – 1616/1636 p.196	P16 – 1642 p.38 P16 – 1732 p.208	P16 – 1648 p.196 P22/P16 – 1950/1059 p.202	P22 – 1661/1668 p.197	P19/P22/P16 – 1677/1703 p.197		P19/P22/P16 – 1704/1720 p.197	P0X – 1749 p.198 P19/P16 – 1759/1761 p.198	P19 – 1759/1761 p.198	P21 – 1980/1982 p.203	P21 – 1986 p.203	P22 – 1998/2000 p.203	P16/P19/P22/P15 – 1770/1793 p.198/199			P19/P15/ P16P22 – 1794/1857 p.199/200				P21 – 1924 p.201/202
Notes:		“(…) if you produce food, you get some you sell” Cash k1000	“we start a business with k500 and then the other one you use at home”	From k500 buy 2 goats (k250 each) After completing a sale cycle: buy others 2 goats from the previous profit – k280, k140 each goat for rearing	Sell the 2 goats for k500 each at Kasumbalesa Cash profit: k500	Transportation cost: k30/goat	Lunch cost: k80	Expenses: k500 (price of 2 goats) +k60 (transportation of 2 goats) + k160 (lunch for 2 people) = k720 Earnings: k1000 (for selling 2 goats) Profit: k1000 - k720 = k280	“start by getting from someone on credit” Loan from AGO RA or OSA WA	“those who cannot get a credit they can do piece work; they give him/her a chicken or something else”	The ox carts destroy the land	“the water is going down because where 10 ox carts can come from its deforestation, destroying the land”	“here what is needed is a law that binds the cutting down of trees”	“if it’s a man he cut one ox-cart of firewood” 10 ox-carts, k20 each	“then from that he comes and say let me not just sit, let me start a business, so k100 for food, k100 let me nu flour and sugar then he starts a business”	“takes it for business, you buy flour, sugar, and salt”	“even chickens he can buy” Buy 4 chickens, k25 each	Sell 4 chickens, k50 each at Kasu kwe Cash profit : k100	“it is just k20 for beer”	Expenses: k100 (price of 4 chickens) + k20 (food) = k120 Earnings: k200 (for selling 4 chickens) Profit: k200 – k120 =k80	“(…) on the livestock, it is reducing because the money is just going to business”
Information source:		Comments heard from the workshop scenario exercise – group 1 discussion/explanation																			

Main argument:		Scenario “No rain and without any help from the government”												
Casual structure:	Cause variable:	Produced Food	Produced Food	Cash	Rental “Business”	Cash (Rental “Business”)	Inputs	Cash (Rental “Business”)	Breeding	Livestock	Loan	Cash	Produced Food	
	Effect variable:	Household Consumption	Cash	Building Houses	Cash	Inputs	Produced food	Livestock	Livestock	Cash	Debt Payback	Inputs (seeds, fertilizer)	Household Consumption/ Sales “Business”	
	Relationship type:	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	
Speaker name; CIN; Transcription page:			P21 – 2012 p.203/205											
Notes:		“(…) he can grow soya beans, maize sunflower, when these crops are all harvested they are put on budget to say how much food I’m going to reserve for household consumption” – this can take years according to E01 – 2015 p.47	“What remains you sell and then the money you keep it to say this money should be used to build a house so that in future it helps me”	Look for a place, hire a brick layer, buy materials; “it will take 7 years for the house to finish” according to E01 – 2039 p.47	“Maybe it is in Kabwe, Chibombo or anywhere where there are a lot of people, there are people who are working but they don’t have where to stay so they can admire that house and rent it in”	“(…) he again gets the money and uses it to buy inputs because the children are still young to start using the money Cash from Rental Business	“(…) he buys inputs he plants and produces food (….)”	“(…) he can get cash and come to feel the cups for livestock when the tenants pay (….)”	“Sometimes it is even difficult to produce enough food for consumption, so here is a wife, they say don’t just sit the chickens are cheap now, that one your grandfather gave you, it produced come and get 2 cocks and sell at k50 each” Profit: k100 (to go to OSAWA)	“What OSAWA does is that they give you money that is bigger than the amount you saved, what is important is that you need to use the money that you get so then you can be able to pay back with the interest required”	Cash from Loan	“Well the he produces and raises a k400, he pays for FISP and they give him 4 * 50 kg bags of fertilizer, he then cultivates and he reaches at a level of producing enough food for consumption and be able to sell some. When he reaches at that level, it means that he also in the position to build a house that will be giving him money so that children can use in future.”		
Information source:		Comments heard from the workshop scenario exercise – group 2 explanation												

Appendix 8. Words-and-arrows Lessons Learned

What to do with cash?

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Cash	Land Owned/Rented	+	Cash $\xrightarrow{+}$ Land Owned/Rented	A	1
Cash	Inputs	+	Cash $\xrightarrow{+}$ Inputs	A/B	2
Cash	Livestock	+	Cash $\xrightarrow{+}$ Livestock	A/B	3
Cash	Water	+	Cash $\xrightarrow{+}$ Rain/Water	A/B	4
Cash	Personal Expenses (luxury, school, sickness, funerals)	+	Cash $\xrightarrow{+}$ Personal Expenses	A/B	5
Cash	Disease Prevention	+	Cash $\xrightarrow{+}$ Disease Prevention	A	6
Cash	Food Purchases	+	Cash $\xrightarrow{+}$ Food Purchases	A/B	7
Cash	Savings	+	Cash $\xrightarrow{+}$ Savings	A/B	8
Cash	Piecework (pay someone to help in the field)	+	Cash $\xrightarrow{+}$ Piecework	B	9

How to increase/decrease cash?

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Food Surplus	Cash	+	Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A	10
Livestock	Sales "Business"	+	Livestock $\xrightarrow{+}$ Sales "Business"	A	11
Piecework	Cash	+	Piecework $\xrightarrow{+}$ Cash	A/B	12
Avoiding Carelessness	Cash	+	Avoiding Carelessness $\xrightarrow{+}$ Cash	A	13
Trees (short term)	Cash	+	Trees $\xrightarrow{+}$ Charcoal $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A/B	14
Sales "Business"	Cash	+	Sales "Business" $\xrightarrow{+}$ Cash	B	15
Produced Food	Cash	+	Produced Food $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	16
Gardening	Cash	+	Gardening $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	17
Avoiding Carelessness (available food)	Cash	+	Avoiding Carelessness $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	18
Good Care (livestock)	Cash	+	Good care $\xrightarrow{+}$ Livestock $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	19
Climate Change	Cash	-	<p>Climate Change $\xrightarrow{-}$ Rain/Water $\xrightarrow{+/-}$ Land (productive land) $\xrightarrow{+}$ Produced Food</p> <p style="text-align: center;">↓ +</p> <p>Cash $\xleftarrow{+}$ Sales "Business" $\xleftarrow{+}$ Food Surplus $\xleftarrow{+}$ Available Food</p>	B	20

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Charcoal (long term)	Cash	-	<p>Charcoal $\xrightarrow{-}$ Trees $\xrightarrow{+}$ Rain/Water $\xrightarrow{+/-}$ Land (productive land) $\xrightarrow{+}$ Produced Food</p> <p style="text-align: center;">↓ +</p> <p style="text-align: center;">Available Food $\xleftarrow{+}$ Food Surplus $\xleftarrow{+}$ Sales "Business" $\xleftarrow{+}$ Cash</p>	B	21
Loan	Cash	+	<p>Loan $\xrightarrow{+}$ Cash</p>	B	22
Livestock	Cash	+	<p>Livestock $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash</p>	B	23
Groundnuts	Cash	+	<p>Groundnuts $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash</p>	B	24
Commerce	Cash	+	<p>Commerce $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash</p>	B	25

How to get food?

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Livestock	Land (productive land)	+	Livestock $\xrightarrow{+}$ Inputs $\xrightarrow{+}$ Land (productive land)	A	26
Land (productive land)	Produced Food	+	Land (productive land) $\xrightarrow{+}$ Produced Food	A	27
Rain/Water	Produced Food	+	Rain/Water $\xrightarrow{+}$ Land (productive land) $\xrightarrow{+}$ Produced Food	A/B	28
Abusive Sales	Available Food	-	Abusive Sales $\xrightarrow{-}$ Available Food	A	29
Avoiding Carelessness	Available Food	+	Avoiding Carelessness $\xrightarrow{+}$ Available Food	A/B	30
Livestock (oxen)	Produced Food	+	Livestock $\xrightarrow{+}$ Inputs $\xrightarrow{+}$ Land (productive land) $\xrightarrow{+}$ Produced Food	A	31
Water (for cooking)	Household Consumption	+	Rain/Water $\xrightarrow{+}$ Household Consumption	B	32
Inputs	Produced Food	+	Inputs $\xrightarrow{+}$ Land (productive land) $\xrightarrow{+}$ Produced Food	B	33
Rain/Water (floods)	Land (productive land)	-	Rain/Water $\xrightarrow{-}$ Land (productive land)	B	34
Debt Avoidance	Available Food	+	Debt Avoidance $\xrightarrow{+}$ Debt Payback $\xrightarrow{+}$ Available Food	B	35

How to improve land fertility/farming?

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Inputs	Land (productive land)	+	Inputs $\xrightarrow{+}$ Land (productive land)	A/B	36
Rain/Water	Land (productive land)	+	Rain/Water $\xrightarrow{+}$ Land (productive land)	A/B	37
Crop Rotation	Land (productive land)	+	Crop Rotation $\xrightarrow{+}$ Land (productive land)	A	38
Crop Diversity	Land (productive land)	+	Crop Diversity $\xrightarrow{+}$ Land (productive land)	A/B	39
Weeding	Land (productive land)	+	Weeding $\xrightarrow{+}$ Land (productive land)	A/B	40
Rain	Land (productive land)	-	Rain/Water $\xrightarrow{-}$ Land (productive land)	A	41
Conservation Farming	Land (productive land)	+	Conservation Farming $\xrightarrow{+}$ Land (productive land)	B	42
Trees (deciduous trees – Musangu)	Inputs	+	Trees $\xrightarrow{+}$ Inputs	B	43
Trees	Rain	+	Trees $\xrightarrow{+}$ Rain/Water	B	44
Liming	Land (productive land)	+	Liming $\xrightarrow{+}$ Land (productive land)	B	45
Livestock	Inputs (manure)	+	Livestock $\xrightarrow{+}$ Inputs	B	46
Piecework (work for others)	Land (productive land) (their own land)	-	Piecework $\xrightarrow{-}$ Land (productive land)	B	47
Charcoal	Rain	-	Charcoal $\xrightarrow{-}$ Trees $\xrightarrow{+}$ Rain	B	48

How to increase livestock?

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Cash	Livestock	+	Cash $\xrightarrow{+}$ Livestock	A/B	49
Good care	Livestock	+	Good care $\xrightarrow{+}$ Livestock	A/B	50
Disease Prevention	Livestock	+	Disease Prevention $\xrightarrow{+}$ Livestock	A/B	51
Breeding	Livestock	+	Breeding $\xrightarrow{+}$ Livestock	A	52

Appendix 9. Words-and-arrows Policy proposals

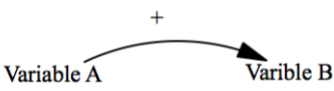

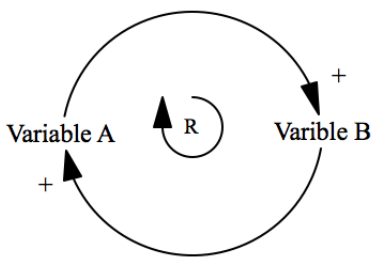
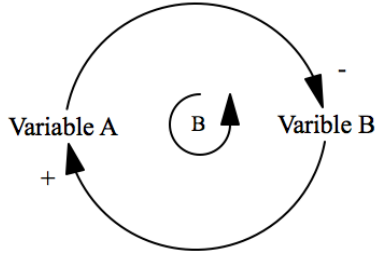
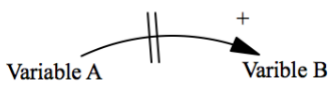
Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Gardening	Available Food	+	Gardening $\xrightarrow{+}$ Available Food	A	53
Rain	Gardening	+	Rain/Water $\xrightarrow{+}$ Gardening	A	54
Water	Livestock	+	Rain/Water $\xrightarrow{+}$ Livestock	A	55
Feed	Livestock	+	Feed $\xrightarrow{+}$ Livestock	A	56
Avoiding Carelessness	Available Food	+	Avoiding Carelessness $\xrightarrow{+}$ Available Food	A	57
Livestock	Inputs (manure, oxen)	+	Livestock $\xrightarrow{+}$ Inputs	A	58
Rain/Water	Retention Basins	-	Rain/Water $\xrightarrow{-}$ Retention Basins/ Drilling Boreholes	A	59
Charcoal	Cash	+/-	Charcoal $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A	60
Cash	Livestock (cattle, goat, chicken)	+	Cash $\xrightarrow{+}$ Livestock	A/B	61
Breeding	Livestock (cow)	+	Breeding $\xrightarrow{+}$ Livestock	A/B	62
Feed (grazing)	Livestock	+	Feed $\xrightarrow{+}$ Livestock	A/B	63
Disease Prevention	Livestock	+	Disease Prevention $\xrightarrow{+}$ Livestock	A	64
Livestock (goat, chicken)	Cash	+	Livestock $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A/B	65
Charcoal	Land (productive land)	-	Charcoal $\xrightarrow{-}$ Land (productive land)	A	66
Charcoal	Rain/Water	-	Charcoal $\xrightarrow{-}$ Trees $\xrightarrow{+}$ Rain	A	67

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Charcoal	Health	-	Charcoal $\xrightarrow{-}$ Health	A	68
Legislation for Deforestation	Charcoal	+/-	Legislation for Deforestation/Afforestation $\xrightarrow{+/-}$ Charcoal	A	69
Groundnuts	Inputs	+	Groundnuts $\xrightarrow{+}$ Inputs	A	70
Groundnuts	Household Consumption	+	Groundnuts $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Household Consumption	A	71
Groundnuts	Health	+	Groundnuts $\xrightarrow{+}$ Health	A	72
Groundnuts	Cash	+	Groundnuts $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A	73
Groundnuts	Available Food	+	Groundnuts $\xrightarrow{+}$ Available Food	A	74
Cash	Personal Expenses (clothes)	+	Cash $\xrightarrow{+}$ Personal Expenses	A/B	75
Food Purchases/Commerce (sewing, selling flitters, fritter)	Cash	+	Food Purchases $\xrightarrow{+}$ Commerce $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	A/B	76
Government	Inputs (fertilizer)	+	Government $\xrightarrow{+}$ Inputs	B	77
Charcoal	Food Purchases	+	Charcoal $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash $\xrightarrow{+}$ Food Purchases	B	78
Afforestation	Rain	+	Legislation for Deforestation/Afforestation $\xrightarrow{+}$ Trees $\xrightarrow{+}$ Rain/Water	B	79
Legislation for Deforestation	Trees	+	Legislation for Deforestation/Afforestation $\xrightarrow{+}$ Trees	B	80
Trees	Produced Food	+	Trees $\xrightarrow{+}$ Land (productive land) $\xrightarrow{+}$ Produced Food	B	81

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Produced Food	Cash	+	Produced Food $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	82
Inputs (manure)	Land (productive land)	+	Inputs $\xrightarrow{+}$ Land (productive land)	B	83
Liming	Land (productive land)	+	Liming $\xrightarrow{+}$ Land (productive land)	B	84
Livestock (chicken)	Sales "Business"	+	Livestock $\xrightarrow{+}$ Sales "Business"	B	85
Crop Rotation	Land (productive land)	+	Crop Rotation $\xrightarrow{+}$ Land (productive land)	B	86
Crop Diversity	Land (productive land)	+	Crop Diversity $\xrightarrow{+}$ Land (productive land)	B	87
Building Houses	Cash (rental "business")	+	Building Houses $\xrightarrow{+}$ Rental "Business" $\xrightarrow{+}$ Cash	B	88
Drilling Boreholes	Rain/Water	+	Retention Basins/ Drilling Boreholes $\xrightarrow{+}$ Rain/Water	B	89
Conservation Farming	Land (productive land)	+	Conservation Farming $\xrightarrow{+}$ Land (productive land)	B	90
Good Care (place to sleep)	Livestock	+	Good care $\xrightarrow{+}$ Livestock	B	91
Cash (kraal)	Good Care	+	Cash $\xrightarrow{+}$ Good Care	B	92
Partnership	Cash	+/-	Partnership $\xrightarrow{+/-}$ Land (productive land) $\xrightarrow{+}$ Produced Food $\downarrow +$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	93
Cash	Household Consumption	+	Cash $\xrightarrow{+}$ Food Purchases $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Household Consumption	B	94

Cause	Effect	+/-	Words-and-arrow diagrams	A/B	MIN
Cash	Transportation (goat)	+	Cash $\xrightarrow{+}$ Transportation	B	95
Cash	Food Purchases (goat, fritter, chicken)	+	Cash $\xrightarrow{+}$ Food Purchases	B	96
Loan	Debt Payback	+	Loan $\xrightarrow{+}$ Cash $\xrightarrow{+}$ Debt Avoidance $\xrightarrow{+}$ Debt Payback	B	97
Piecework	Livestock (chicken)	+	Piecework $\xrightarrow{+}$ Livestock	B	98
Piecework (ox carts)	Land Owned/Rented	-	Piecework $\xrightarrow{-}$ Land Owned/Rented	B	99
Piecework (ox carts)	Water	-	Piecework $\xrightarrow{-}$ Trees $\xrightarrow{+}$ Rain/Water	B	100
Piecework (ox carts)	Cash	+	Piecework $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	101
Abusive Sales	Livestock	-	Abusive Sales $\xrightarrow{-}$ Livestock	B	102
Produced Food	Household Consumption	+	Produced Food $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Household Consumption	B	103
Cash	Building Houses	+	Cash $\xrightarrow{+}$ Building Houses	B	104
Rental "Business"	Cash	+	Rental "Business" $\xrightarrow{+}$ Cash	B	105
Cash (Rental "Business", Loan)	Inputs	+	Cash $\xrightarrow{+}$ Inputs	B	106
Inputs	Produced Food	+	Inputs $\xrightarrow{+}$ Land (productive land) $\xrightarrow{+}$ Produced Food	B	107
Produced Food	Sales "Business"	+	Produced Food $\xrightarrow{+}$ Available Food $\xrightarrow{+}$ Food Surplus $\xrightarrow{+}$ Sales "Business" $\xrightarrow{+}$ Cash	B	108

Appendix 10. Causal Loop Diagrams notation (Source: Videira et al. 2014)

Causal Loop Diagrams symbols	Representation	Reading and interpretation
Positive links		<p>Colloquial:</p> <ul style="list-style-type: none"> • If A goes up (down) then B will go up (down); • If there is a change on A then B will change in the same direction. <p>Formal:</p> <ul style="list-style-type: none"> • All else equal, if A increases then B increases above what it would have been; • All else equal, if A decreases then B decreases below what it would have been; • In case of accumulation (i.e. stock-flow relationships) if A increases it will add to B.
Negative links		<p>Colloquial:</p> <ul style="list-style-type: none"> • If A goes up (down) then B will go down (up); • If there is a change on A then B will change in the opposite direction. <p>Formal:</p> <ul style="list-style-type: none"> • All else equal, if A increases then B decreases above what it would have been; • All else equal, if A decreases then B increases below what it would have been; • In case of accumulation (i.e. stock-flow relationships) if A subtracts from B.
Reinforcing (or positive) loops		<p>Colloquial:</p> <ul style="list-style-type: none"> • A feedback loop is positive if the number of negative links is even, thus reinforcing a given initial change. <p>Formal:</p> <ul style="list-style-type: none"> • Tracing the effect of a change in any of the variables around the loop reveals that the feedback effect reinforces the initial change; • Positive feedback loops are sources of growth, erosion and collapse in systems.
Balancing (or negative) loops		<p>Colloquial:</p> <ul style="list-style-type: none"> • A feedback loop is negative if the number of negative links is odd, thus opposing disturbances and self-correcting/balancing a given change. <p>Formal:</p> <ul style="list-style-type: none"> • Tracing the effect of a change in any of the variables around the loop reveals that the feedback effect opposes the initial change.
Time delays		<ul style="list-style-type: none"> • Time delays that are perceived relevant to the dynamics of the system may be represented explicitly in causal loop diagrams (e. g. using mark crossing the causal link arrow). This convention denotes that the causal effect A has on B is significantly delayed in time, although the delay time is not usually specified in these diagrams.